The Journal of Effective Teaching

JET

an online journal devoted to teaching excellence

Volume 16/Issue 1/February 2016
EDITORIAL BOARD

Editor-in-Chief
Dr. Russell Herman, University of North Carolina Wilmington

Editorial Board
Diana Ashe, English
Madeleine Bombeld, Library Science
Caroline Clements, Psychology
Pamela Evers, Business and Law
John Fischetti, Education
Russell Herman, Mathematics and Physics

Associate Editor
Diana Ashe, UNCW Center for Teaching Excellence, English

Consultants
Librarian - Madeleine Bombeld

Reviewers
Glenn A. Bowen, Barry University, FL
Alison Burke, Southern Oregon University, OR
Marsha Carr, UNC Wilmington, NC
Dorian B. Crosby, Spelman College, GA
Lisa Dierker, Wesleyan University, CT
Christina Downey, Indiana University Kokomo, IN
Pamela Evers, UNC Wilmington, NC
John Fischetti, Southern Louisanna University, LA
Chandra Foote, Niagara University, NY
Sarah Ginsberg, Eastern Michigan University, MI
Jana Hackathorn, Murray State University, KY
Jace Hargis, Higher College of Technology, UAE
Scott Imig, UNC Wilmington, NC
Susan Kraus, Fort Lewis College, CO
Nancyruth Leibold, Southwest Minn. State U, MN
Amanda Little, Wisconsin-Stout, WI
Twila Lukowiak, Bradley University, IL
Nancy McCormick, Middle Tennessee State, TN
Samuel B. Pond, III, N C State University, NC
Hans Schmidt, Penn State Univ., Brandywine, PA
Jennifer T. Tasgold, Meredith College, NC
Kevin M. Thomas, Bellarmine University, KY
Kenneth Wolf, University of Colorado Denver, KY
Ellen Yeh, Columbia College, IL

Submissions
The Journal of Effective Teaching is published online at http://www.uncw.edu/cte/et/. All submissions should be directed electronically to Dr. Russell Herman, Editor-in-Chief, at jet@uncw.edu. The address for other correspondence is

The Journal of Effective Teaching
c/o Center for Teaching Excellence
University of North Carolina Wilmington
601 S. College Road
Wilmington, NC 28403 USA
FAX 910-962-3427

(ISSN 1935-7869 for limited print issues and ISSN 1935-7850 for the online issues)

©2016 All rights reserved.
CONTENTS

Letter from the Editor-in-Chief: Learning from the Discovery of Gravitational Waves
Russell L. Herman ................................................................. 1-4

Scholarship of Teaching

The Effect of Content Delivery Media on Student Engagement and Learning Outcomes
Kari A. Hunt, Margaret N. Trent, Justina R. Jackson, Jenee M. Marquis,
Shannon Barrett-Williams, Rachel Gurvitch, and Michael W. Metzler ....................... 5-18

Using Open-Book Exams to Enhance Student Learning, Performance, and Motivation
Steve G. Green, Claudia J. Ferrante, and Kurt A. Heppard ................................. 19-35

Strategies for Building Positive Student-Instructor Interactions in Large Classes
Oscar J. Solis and Windi D. Turner .................................................. 36-51

The Perceived Effects of Flipped Teaching on Knowledge Acquisition
Galen Newman, Jun-Hyun Kim, Ryun Jung Lee, Brandy A. Brown, and
Sharon Huston ................................................................. 52-71

The Who, What, and Where of Learning Strategies
Amber D. Dumford, Cindy A. Cogswell, and Angie L. Miller .................... 72-88

Effective Teaching

Innovations in Teaching: How Novice Teaching Assistants Include
LGBTQ Topics into the Writing Classroom
Katy Jaekel ................................................................. 89-101

CALL FOR PAPERS

The Journal of Effective Teaching is accepting submissions for review for the Fall 2016 issue. Manuscripts will be due May 31, 2016. The expected publication date will be September 30th. Articles will be accepted in any of the Content Areas supported by the journal.
INFORMATION FOR AUTHORS

The Journal of Effective Teaching is an electronic journal devoted to the exchange of ideas and information about undergraduate and graduate teaching. Articles are solicited for publications which address excellence in teaching at colleges and universities. We invite contributors to share their insights in pedagogy, innovations in teaching and learning, and classroom experiences in the form of a scholarly communication which will be reviewed by experts in teaching scholarship. Articles should appeal to a broad campus readership. Articles which draw upon specific-discipline based research or teaching practices should elaborate on how the teaching practice, research or findings relates across the disciplines. We are particularly interested in topics addressed in the particular Content Areas described at this site, including empirical research on pedagogy, innovations in teaching and learning, and classroom experiences.

The Journal of Effective Teaching will be published online twice a year at the web site http://www.uncw.edu/cte/ET/. All manuscripts for publication should be submitted electronically to the Editor-in-Chief, Dr. Russell Herman, at jet@uncw.edu. Articles will be reviewed by two to three referees.

Manuscripts for publication should:

- Follow APA guidelines (5th Edition).
- Include an abstract and 3-5 keywords.
- Typeset in English using MS Word format and 12 pt Times New Roman
- Articles/essays on effective teaching should be 2000-5000.
- Research articles should be 3000-8000 words.
- Tables and figures should be placed appropriately in the text.

All articles published in The Journal of Effective Teaching will be copyrighted under the Creative Commons "Attribution-Non Commercial-No Derivs" license. The Journal of Effective Teaching will require that the author sign a copyright agreement prior to publication.

<table>
<thead>
<tr>
<th>Deadlines for Upcoming Issues</th>
<th>Fall 2016</th>
<th>Spring 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submissions Due</td>
<td>May 31, 2016</td>
<td>October 31, 2016</td>
</tr>
<tr>
<td>Notification of Acceptance</td>
<td>July 31, 2016</td>
<td>December 31, 2016</td>
</tr>
<tr>
<td>Final Manuscripts Due</td>
<td>August 31, 2016</td>
<td>January 31, 2017</td>
</tr>
</tbody>
</table>
Letter from the Editor-in-Chief:  
Learning from the Discovery of Gravitational Waves

Russell L. Herman¹  
The University of North Carolina Wilmington, Wilmington, NC

It’s of no use whatsoever ... this is just an experiment that proves Maestro Maxwell was right—we just have these mysterious electromagnetic waves that we cannot see with the naked eye. But they are there. – Heinrich Rudolph Hertz,

Two seemingly unrelated topics crossed my thoughts this Spring, the discovery of gravitational waves, resulting from the collision of two black holes 1.3 billion years ago, and the discussion of the achievement gap in STEM (Williams, 2016). The discovery of gravitational waves emphasizes the importance of developing Dweck’s (2006) open mind set which leads to “a desire to learn” and therefore “a tendency to persist despite obstacles.”

Often students want to see the relevance of what they are studying to their everyday lives. What good is algebra, the conservation of momentum, poetry, or the study of the Roman empire? What practical applications are there for the recently discovered Higgs boson or gravitational waves?

Electromagnetic waves were predicted by James Clerk Maxwell in the 1860’s. It took almost thirty years before Hertz produced electromagnetic waves in the lab in 1887. When asked about the implications of his discovery, Hertz reportedly said, “Nothing I guess.” However, a few years later, Guglielmo Marconi invented wireless telegraphy, which eventually led to radio, TV, and many other technologies involving electromagnetic waves.

More recently, a team of scientists in the LIGO project, through years of hard work and vision, observed gravitational waves resulting from the merger of two black holes 1.3 billion years ago. It was the centenary of the theory of General Relativity proposed by Albert Einstein (1915, 1981) that predicted their existence. Over the years Einstein sometimes doubted the existence of gravitational waves, never thought they would be found, and he never believed that his theory would lead to practical applications. However, the modern day GPS technology relies on both the Special and General Theories of Relativity in order to accurately guide airplanes and cars to their final destinations. While it is too early to say if there will be “practical applications” of these recent discoveries, there are many questions yet to be answered about the nature of the universe, black holes, and the development of new technologies to keep the search for new knowledge going.

¹ Author's email: hermanr@uncw.edu

The Journal of Effective Teaching, Vol. 16, No.1, 2016, 1-4
©2016 All rights reserved.
What lessons do these problems provide which can be taken to the classroom? There are several. First, real-life problems, such as electromagnetic and gravitational wave theory, are challenging. It takes perseverance to solve these problems, even when a solution is expected. It takes some creativity to solve the problems. Along the way, many attempts are made and sometimes one fails many times until that perseverance wins out. Einstein worked for several decades on the problem of gravitational waves along with other problems.

The same can be said of learning or of trying new things. Often people fall into a particular mindset of thinking that they cannot perform certain tasks. For example, it is common to dismiss one’s potential to do math. It has become fashionable to claim that “I am not good at math.” This is what is referred to by Dweck (2014) as a fixed mindset. What one perhaps should say is “I am not good at math, yet.”

This was part of the message presented by Talithia Williams (2016) at a recent mathematics conference in a discussion about the challenges of bringing underrepresented minorities into STEM (Science, Technology, Engineering, and Mathematics). As noted in her presentation (Table 1.), the percentage of underrepresented minorities obtaining higher levels of science and engineering degrees diminishes. This is in part, according to her, that these students grow up with a fixed mindset, whether it is cultural, economic, or otherwise communicated that they cannot participate fully in STEM areas.

### Table 1. Percentages of Underrepresented Minorities (URM) in Science in Engineering in the U.S. (2007 data).

<table>
<thead>
<tr>
<th></th>
<th>URM</th>
<th>Caucasian</th>
<th>Foreign</th>
</tr>
</thead>
<tbody>
<tr>
<td>S&amp;E Doctorate</td>
<td>5.4%</td>
<td>52.0%</td>
<td>42.6%</td>
</tr>
<tr>
<td>S&amp;E Masters</td>
<td>14.6</td>
<td>58.3%</td>
<td>27.1%</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>17.8</td>
<td>70.3%</td>
<td>11.9%</td>
</tr>
<tr>
<td>S&amp;E BD</td>
<td>17.7</td>
<td>78.3%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Undergraduates</td>
<td>26.2</td>
<td>71.7%</td>
<td>2.1%</td>
</tr>
<tr>
<td>College age</td>
<td>33.2</td>
<td>66.8%</td>
<td>0%</td>
</tr>
<tr>
<td>K-12 Students</td>
<td>38.8</td>
<td>61.2%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Dweck (2008) spent years researching the effect of mindset on learning science and mathematics. She defines two types of mindsets. A fixed mindset comes from the belief that your qualities are carved in stone. A growth mindset comes from the belief that your basic qualities are things you can cultivate through effort. Too often on attributes success in various fields as an innate ability that one is born with.

Dweck (2014) has found that children with a fixed mindset who are challenged and fail are discouraged. They then turn to negative behaviors such as cheating or running from...
challenges. What we do not teach effectively is that it takes hard work and perseverance to master many subjects. Just as researchers often take many false paths to solve challenging problems, it also takes a similar effort to learn to tackle math and other problems. Students should learn that abilities can be developed. In other words, they need a growth mindset. Armed with this idea, they can succeed as shown in Table 2. (Williams, 2016)

Table 2. Characteristics of Fixed and Growth Mindsets

<table>
<thead>
<tr>
<th>Fixed Mindset</th>
<th>Growth Mindset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intelligence is Static</td>
<td>Intelligence can be developed</td>
</tr>
<tr>
<td>Leads to a desire to look smart, and, therefore, a tendency to avoid challenges; give up easily due to obstacles; see effort as fruitless; ignore useful feedback; be threatened by others’ success.</td>
<td>Leads to a desire to learn, and, therefore, a tendency to embrace challenges; persist despite obstacles; see effort as path to mastery; learn from criticism; be inspired by others’ success.</td>
</tr>
</tbody>
</table>

How does Dweck propose that this can be accomplished? Dweck (2014) notes that we can praise wisely, not praising intelligence or talent. Students should be rewarded for effort, strategy, and progress. If they are not focused on grades, they then learn how to succeed. Williams (2016) suggests that instructors need to change the way they confronted students with fixed mindsets and help them to progress to open mindsets.

Many students come to colleges with a fixed mindset. They have already written off any potential to do mathematics, which affects the numbers in STEM fields. Perhaps that is why the success in college is reflected by the level of mathematics that they already reached in high school. Adelman (1999, 2006) had conducted two long studies of what predicts the success of students in the completion of college degrees. He noted that

Of all the pre-college curricula, the highest level of mathematics one studies in secondary school has the strongest continuing influence on bachelor’s degree completion.

Adelman found that there is a math ladder: Pre-Algebra, Algebra I, Geometry, Algebra II, Trigonometry, Precalculus, Calculus. The higher up the ladder, the greater the chance of completing a bachelor’s degree. For example, 7% completing Algebra I complete a bachelor’s degree. For Algebra II it is 39%. For Precalculus it is 75%. And, for calculus, it is 83%. Williams (2016) notes that this probably because one learns how to develop an open mind set as one earns to overcome the challenges of problem solving. The ability to learn to fail and try again until a solution is obtained may be precisely what one needs to succeed no matter what discipline one eventually follows.
The same open mind sets drive the discoveries described at the beginning of the paper. The search to find Einstein’s gravitational waves had a history of failures and success that lead to this point. It is this lesson, more than the result itself, that can be used to inspire students to learn to have an open mindset. [See Hindle for more on mindsets, particularly for mathematics.]

References


Williams, T (2016) Addressing the Achievement Gap in STEM, 28th International Conference on Technology in Collegiate Mathematics, Atlanta, GA.
The Effect of Content Delivery Media on Student Engagement and Learning Outcomes

Kari A. Hunt¹, Margaret N. Trent, Justina R. Jackson, Jenee M. Marquis, Shannon Barrett-Williams, Rachel Gurvitch, and Michael W. Metzler
Georgia State University, Atlanta, GA, 30302

Abstract

To gather more objective information about effective teaching and levels of student engagement, research in higher education has shifted to increased observations within the college classrooms and is focused more on the collection of systematic data. Despite the attempt by instructors to implement various pedagogies and use different instructional approaches in the classroom setting, research into teaching and learning suggests that it may depend less on what the instructor is doing and more on the relationship between teaching and student learning, and to what degree students are engaged. A number of studies have been designed to compare and contrast various methods for delivering content, with most of the research leading to mixed results. In this particular study, results indicated the media in which an instructor delivers content does not necessarily translate to greater student learning outcomes. The purpose of this study was to systematically analyze the effect of content delivery media on student engagement, learning outcomes, and instructor behavior in two sections of the same lecture-based college Biomechanics course. Educating and encouraging instructors to implement more interactive and active teaching methods will assist them in fostering student engagement.

Keywords: Student engagement, learning outcomes, content delivery.

For those in the teaching profession, there is an inherent desire to capture the interest of students and engage them in the subject matter being taught and learned (Smith, Jones, Gilbert, & Wieman, 2013). Although many in higher education understand the importance of student engagement as a prerequisite to learning, there are still many questions surrounding why and when students choose to engage, and ultimately which teaching methods are most likely to increase engagement, and thereby improve learning (Berrett, 2014; Perrotta & Bohan, 2013; Smith, Jones, Gilbert, & Wieman, 2013; Wieman & Gilbert, 2014). In an attempt to foster student engagement and stay on pace with the latest technological advances in teaching, higher education instructors are starting to shift from traditional lecture-based formats to more interactive methods and techniques (Hora & Ferrare, 2014; Kuh, Kinzie, Buckley, Bridges, & Hayek, 2006; Perrotta & Bohan, 2013). Despite attempts by some instructors to implement various pedagogies and use different instructional approaches in the classroom setting, research into teaching and learning suggests that it may depend less on what the instructor is doing in class and that

¹ Corresponding author’s email: khunt6@student.gsu.edu

The Journal of Effective Teaching, Vol. 16, No.1, 2016, 5-18
©2016 All rights reserved.
the relationship between teaching and student learning is more dependent in the degree to which students are engaged with the content (Hora & Ferrare, 2014; Lukowiak & Hunziker, 2013).

Hu and Kuh (2002) succinctly define student engagement as, “the quality of effort students themselves devote to educationally purposeful activities that contribute directly to desired outcomes” (p. 555). In addition to student engagement, teaching and learning are dependent on many contextual factors, including the instructor, learner, subject matter, environment(s), teaching or delivery methods (Meo et al., 2013; Zepke & Leach, 2010), and the activity in which the students are involved (Shernoff & Csikszentmihalyi, 2009). Instructors can select from a wide range of content delivery methods and media to present course content, including chalkboard, PowerPoint presentations, hybrid formats, and completely online media. According to Seth, Upadhyaya, Ahmad, and Moghe (2010), the predominant medium to deliver content in the college classroom setting is still the chalkboard, although PowerPoint is becoming increasingly more popular. Prabhu, Pai, Pranbh, and Shrilath (2014) mention that teaching with the chalkboard engages learners actively and the learner is more attentive to what the instructor is discussing, writing and illustrating on the board. On the other hand, PowerPoint is useful in larger groups (50 to 100) and is often used to enhance visual quality of text and figures. Ultimately, the choice to use the chalkboard or PowerPoint lies with the instructor and should be chosen to enhance learning (Prabhu et al., 2014).

Comparing different media used to deliver content and the subsequent effects on student learning, Prabhu et al. (2014) found no significant difference in pre and post- multiple choice test scores for students in one section of the same course taught using PowerPoint and another section taught using a chalkboard. Authors concluded that both media chosen to deliver the content have their respective benefits in the college classroom. Another study comparing PowerPoint with chalkboard found that the integrated use of both PowerPoint and chalkboard media, rather than each medium used alone, was more suitable (i.e., more knowledge gain) for teaching undergraduate medical students (Meo et al., 2013). In another study, students who attended a class using chalkboard obtained significantly higher test scores compared to those who attended the same content-based lecture using PowerPoint, suggesting that chalkboard teaching has the advantage of better recall for medical students (deSa & Keny, 2014). While comparing three different delivery methods (lecture, hybrid, and online), results of Gonzalez’s (2014) six year study indicated that the highest student success rates were achieved for those taught using blended media to deliver content, followed by hybrid, then lecture. Traditional lecturing without the use of chalkboard or PowerPoint has been found to be a less effective method for delivering content to students (Gonzalez, 2014); however, empirical evidence that indicates the extent to which different media improves student performance is still lacking (Bartsch & Cobern, 2003). While any instructional aid has the potential to be effective, the instructor must reflect on their current practice and choose the appropriate medium to influence and positively impact their students’ learning experience (Aranha, Shettigar, & Varghese, 2013; Lane & Harris, 2015).
To gather more objective information about effective teaching and levels of student engagement, research in the field has shifted to increased observations within the college classrooms and is focused more on the collection of systematic data. In his article discussing the state of college teaching, Berrett (2014) points out how critics view the teaching as “insufficiently interactive” and indicates that the knowledge we do have on teaching is based primarily on self-report data from student evaluations or from the instructors themselves. To increase the knowledge base in this area, Berrett (2014) communicates the need for, and the value of, direct observation to find out what exactly is happening in the classroom. To gain a more accurate picture of teaching practices, observation tools and protocols should be developed from a more scientific lens and “broken into its atoms, categorized, and analyzed” (Berrett, 2014). Observations should not be limited to only the behavior of the instructor, the methods of teaching, or the media chosen to deliver instruction, they should also capture the use of instructional technology and more subtle pedagogical strategies, such as the nature of questions, humor, illustrations, and anecdotes, which all play a critical role in instruction (Hora & Ferrare, 2014). A narrow focus on only the instructor will prevent the observer from gathering valuable data on one of the most critical determinants of learning - that of student engagement with the course content (Hora & Ferrare, 2014). Despite the continued challenged to conceptualize and measure the construct of student engagement (Sinatra, Heddy, & Lombardi, 2015), there is a paucity of research and a lack of authentic observational data related to student behavior as the unit of measurement (Lane & Harris, 2015) and the associated learning outcomes in higher education. Therefore, the purpose of this study was to systematically analyze the effect of content delivery media on student engagement, learning outcomes, and instructor behavior in two sections of the same lecture-based college Biomechanics course.

Method

Setting

The study took place at an urban university in the Southeastern United States. The setting for the study included two sections of the same introductory undergraduate Biomechanics course during the fall of 2014. Biomechanics is required for all Exercise Science majors at the university. Each section met for a 50-minute lecture twice a week, and a lab section once a week. Each section had a total of 41 and 36 students, respectively. The lab classes were taught by teaching assistants and therefore were not included as part of the study due to the intended focus on only the primary course instructor. Each section of the course was taught using a different medium to deliver content to students during lectures. The same instructor implemented instruction using each medium. Content in one section was delivered primarily via electronic PowerPoint-based media presentations (referred to as the “PowerPoint” [PPT] section). Content in the other section was delivered primarily with the use of a whiteboard (referred to as the “Whiteboard” [WB] section). Live demonstrations, interactions, and the use of video were also deployed in each section; however, sections were labeled according to the primary method used to deliver content to the students in each section.
Participants

Participants in the study included the instructor of the Biomechanics course and the students in the two sections who consented to participate. The instructor for the study was self-recruited, having approached the senior investigator with the intention to conduct the study in the fall of 2014. Following approval from the institution’s IRB, consent for instructor and student participation was obtained prior to the start of the semester. The instructor has taught Biomechanics every semester for 11 years at this university. Students were recruited in the first class meeting of each section. Initially, 49 students within both course sections consented to participate in the study. After one student withdrew, a total of 48 students participated in the study (N [PPT] = 22; N [WB] = 26). Only students enrolled in the course were included in the recruitment process.

Data Collection

Student Engagement

A customized observation instrument was developed to observe and code student behaviors in person during classes. Prior to the start of data collection four graduate students on the research team were trained to observe students with an acceptable level of interobserver agreement at or above 80% on each defined category. Observer reliability was checked again three additional times during the data collection period; all observers remained above the 80% criterion on all categories throughout the study. The observation-coding instrument consisted of both duration and frequency recorded categories of behaviors. Researchers observed eight randomly selected students in two-minute rotational sequences in each class meeting. The lecture room was divided into four quadrants, with two students selected from each quadrant in each class. The live observations of students took place twice a week for the 50-minute class throughout the entire semester, excluding non-content delivery days (e.g., course introduction, reviews, tests). This resulted in approximately half of all class meetings (N = 18) being observed for each section. See Table 1 for the specific categories of student behaviors included in the observation instrument.

Student Learning Outcomes

Additional sources of data included learning outcomes from a variety of sources including three exams and final course grade. The instructor provided the researchers with exam and final grades for each consenting student in the sample.

Instructor Behavior

A customized observation instrument was developed to observe instructor behaviors during lecture classes. See Table 2 for the specific categories of instructor behaviors included in the observation instrument. Four graduate students on the research team were trained to observe the instructor with an acceptable level of interobserver agreement at or above 80% on all categories. Observer reliability was checked again three additional
Table 1. Student Behavior Categories.

<table>
<thead>
<tr>
<th>Duration Recording Categories</th>
<th>Descriptor</th>
<th>Code</th>
<th>Definition/Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Task (in class)</td>
<td>Individual</td>
<td>TI</td>
<td>Student is participat</td>
</tr>
<tr>
<td></td>
<td>Group</td>
<td>TG</td>
<td>ing in content-related</td>
</tr>
<tr>
<td></td>
<td>Class</td>
<td>TC</td>
<td>task assigned only to</td>
</tr>
<tr>
<td>2 Listening</td>
<td>L</td>
<td></td>
<td>them.</td>
</tr>
<tr>
<td>3 Reading or Taking Notes</td>
<td>RTN</td>
<td></td>
<td>Student is reading con</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>tent-related material</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>or actively taking writing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(or typing) class notes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>*Make note if reading. If</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>reading is assigned it</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>is considered a ‘task’.</td>
</tr>
<tr>
<td>4 Content Interaction</td>
<td>CI</td>
<td></td>
<td>Student is interacting</td>
</tr>
<tr>
<td>5 Off Task</td>
<td>Sleeping</td>
<td>OTS</td>
<td>with instructor.</td>
</tr>
<tr>
<td></td>
<td>Talking</td>
<td>OTT</td>
<td>Student is sleeping/eyes</td>
</tr>
<tr>
<td></td>
<td>Absent</td>
<td>OTA</td>
<td>closed/head on desk.</td>
</tr>
<tr>
<td></td>
<td>Media</td>
<td>OTM</td>
<td>Student leaves room.</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>OTO</td>
<td>Student is using tech</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>nology (phone, computer)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>for non-content purposes.</td>
</tr>
<tr>
<td>6 Management</td>
<td>MG</td>
<td></td>
<td>Student is engaged in ma</td>
</tr>
<tr>
<td>7 Other</td>
<td>O</td>
<td></td>
<td>nagement task such as</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>attendance, receiving</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>graded papers or admin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>istration of materials</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>for class.</td>
</tr>
<tr>
<td>Frequency/Event Categories</td>
<td>Code</td>
<td></td>
<td>Definition/Example</td>
</tr>
<tr>
<td>1 Questioning - open ended</td>
<td>QO</td>
<td></td>
<td>Student asks a type of</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>question (content-related</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>only) that requires</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>explanation.</td>
</tr>
<tr>
<td>2 Questioning - closed</td>
<td>QC</td>
<td></td>
<td>Student asks the type of</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>question (content-related</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>only) that has only one</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>answer.</td>
</tr>
<tr>
<td>3 Raising Hand - called on</td>
<td>RHC</td>
<td></td>
<td>Student raises hand and is</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>called on by instructor.</td>
</tr>
<tr>
<td>4 Raising Hand - not called on</td>
<td>RHN</td>
<td></td>
<td>Student raises hand and is</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>not called on by instructor.</td>
</tr>
<tr>
<td>5 Call Out</td>
<td>CO</td>
<td></td>
<td>Student answers question</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>without being called upon</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>by instructor.</td>
</tr>
<tr>
<td>6 Reply - correct</td>
<td>RC</td>
<td></td>
<td>Student answer is correct.</td>
</tr>
<tr>
<td>7 Reply - incorrect</td>
<td>RI</td>
<td></td>
<td>Student answer is incorrect.</td>
</tr>
<tr>
<td>8 Reply - redirected</td>
<td>RR</td>
<td></td>
<td>Student has been</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>redirected, and the</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>interaction chain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>continues.</td>
</tr>
<tr>
<td>9 No Reply</td>
<td>NR</td>
<td></td>
<td>Student is not acknowledged by the instructor.</td>
</tr>
</tbody>
</table>
Table 2. Instructor Behavior Categories.

<table>
<thead>
<tr>
<th>Group</th>
<th>Duration Recording Category</th>
<th>Code</th>
<th>Definition/Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Episode (Duration)</td>
<td>Management</td>
<td>M</td>
<td>Instructor is discussing assignments with students, setting up technology, etc.</td>
</tr>
<tr>
<td></td>
<td>Review</td>
<td>R</td>
<td>Instructor is reviewing previous class content.</td>
</tr>
<tr>
<td></td>
<td>New Content</td>
<td>NC</td>
<td>Instructor is presenting new content. Does not include problem solving.</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>O</td>
<td>Anything not described above.</td>
</tr>
<tr>
<td>Delivery (Duration)</td>
<td>Instruction-Whiteboard</td>
<td>IW</td>
<td>Instructor is writing on and/or referring to content (texts or images) on whiteboard while lecturing and/or problem solving.</td>
</tr>
<tr>
<td></td>
<td>Instruction-Media</td>
<td>IM</td>
<td>Instructor is lecturing and/or referring to content on any technology that is NOT the whiteboard and/or problem solving.</td>
</tr>
<tr>
<td></td>
<td>Instruction-Modeling</td>
<td>IMO</td>
<td>Instructor is modeling while lecturing and/or problem solving.</td>
</tr>
<tr>
<td></td>
<td>Instruction Only</td>
<td>IO</td>
<td>Instructor is lecturing without the use of ANY visual aid or technology (i.e. white board is blank).</td>
</tr>
<tr>
<td></td>
<td>Non-Verbal- Media</td>
<td>NVM</td>
<td>Instructor is not speaking while playing a video or audio clip.</td>
</tr>
<tr>
<td></td>
<td>Non-Verbal- White Board</td>
<td>NVW</td>
<td>Instructor is NOT speaking while writing on whiteboard.</td>
</tr>
<tr>
<td></td>
<td>Wait Time</td>
<td>W</td>
<td>Instructor waits for student responses to questions or task/problem solving completion.</td>
</tr>
<tr>
<td></td>
<td>Anecdote</td>
<td>A</td>
<td>Instructor tells a story about his personal life (self, family).</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>O</td>
<td>Instructor is presenting content in a way not described above.</td>
</tr>
<tr>
<td>Teacher Behavior (Frequency)</td>
<td>Modeling- Self</td>
<td>MS</td>
<td>Instructor is using his own body to demonstrate a concept or content.</td>
</tr>
<tr>
<td></td>
<td>Modeling- Other</td>
<td>MO</td>
<td>Instructor is using a prop or artifact to demonstrate a concept or content.</td>
</tr>
</tbody>
</table>
|                        | Anecdote- Relevant          | AR   | Instructor tells a story about him-  

©2016 All rights reserved.
<table>
<thead>
<tr>
<th>Interaction Type</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anecdote- Non-relevant</td>
<td>ANR</td>
<td>The instructor tells a story about himself that does not relate to class content.</td>
</tr>
<tr>
<td>Teacher Question/Task to Class</td>
<td>QC</td>
<td>The instructor asks a question to class or gives class task/problem to solve.</td>
</tr>
<tr>
<td>Teacher Question Individual</td>
<td>QI</td>
<td>The instructor asks a question to individual student.</td>
</tr>
<tr>
<td>Student Initiates Question</td>
<td>SQ</td>
<td>The student asks a question to the instructor.</td>
</tr>
<tr>
<td>Other</td>
<td>O</td>
<td>The instructor is engaged in behavior other than described in categories above.</td>
</tr>
<tr>
<td>Interactions (Frequency)</td>
<td>R</td>
<td>Question that does not require a response.</td>
</tr>
<tr>
<td></td>
<td>OP</td>
<td>Question that requires explanation but does not have one specific answer sought by the instructor.</td>
</tr>
<tr>
<td></td>
<td>CL</td>
<td>Question that has one specific answer sought by the instructor. Answer choices can include yes/no, one word answer, definitions, brief explanations, and/or checking for understanding.</td>
</tr>
<tr>
<td>Correct Answer</td>
<td>CA</td>
<td>The instructor informs student or class that answer is correct.</td>
</tr>
<tr>
<td>Incorrect Answer</td>
<td>IA</td>
<td>The instructor informs student or class that answer is incorrect.</td>
</tr>
<tr>
<td>Teacher Self Answers</td>
<td>TSA</td>
<td>The instructor responds to student question or his own question (could happen if no one speaks up to answer a question, or if instructor does not hear the correct answer from the class, and then answers the question himself).</td>
</tr>
<tr>
<td>Teacher No Reply</td>
<td>TNR</td>
<td>The instructor does not respond directly to student.</td>
</tr>
<tr>
<td>Teacher Re-Direct</td>
<td>TRE</td>
<td>The instructor re-directs the question to either an individual or the class.</td>
</tr>
</tbody>
</table>
times during the data collection period; all observers remained above the 80% criterion on all categories throughout the study. The instructor was videotaped during each section twice per week, resulting in recordings of approximately half of total semester classes, minus one for technical difficulties ($N = 17$). The trained observers used the video recordings for systematic observation and coding of instructor behaviors. The observation coding instrument consisted of both duration and frequency recorded categories of behaviors.

**PowerPoint Usage and Content**

A customized analytic instrument was developed to collect frequency data on PowerPoint slide usage per class in each of the two sections to verify the difference between the two sections on the medium used to deliver content. A graduate student on the research team utilized the video recordings of instructor behaviors to systematically code frequency of content per section, resulting in content collection from approximately half of all class meetings ($N = 17$). See Table 3 for the specific categories included in the observation instrument.

<table>
<thead>
<tr>
<th>Frequency/Event Categories</th>
<th>Code</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Text</td>
<td>T</td>
<td>PowerPoint slide consisted of text only (i.e. words, numbers, definitions, equations).</td>
</tr>
<tr>
<td>2 Picture</td>
<td>P</td>
<td>PowerPoint slide consisted of pictures only (i.e. images, graphics).</td>
</tr>
<tr>
<td>3 Video</td>
<td>V</td>
<td>PowerPoint slide consisted of video only (i.e. link to video).</td>
</tr>
<tr>
<td>4 Text &amp; Picture</td>
<td>TP</td>
<td>PowerPoint slide consisted of combination of text and pictures.</td>
</tr>
</tbody>
</table>

**Data Analysis**

Data were analyzed using SPSS and descriptive statistics were reported for student engagement, instructor behavior, and PowerPoint content. Independent $t$-tests were used to compare instructor behaviors, student engagement, and student learning outcomes (grades) between the two course sections.

**Results**

**Student Engagement**

Descriptive statistics and independent sample $t$-tests were conducted to analyze differences between sections on four main student engagement categories: Listening, Reading/taking notes, Content interaction, and Off-task (See Figure 1). Results revealed the student engagement behaviors between the two classes were not statistically significantly different on the four main student engagement: listening [$t(15) = -.08, p = 0.94$], reading
or taking notes \([t(15) = 1.85, p = .09]\), content interaction \([t(15) = -.52, p = .61]\), and off-task behavior \([t(15) = -1.068, p = .30]\).

**Student Learning Outcomes**

A comparison of group mean GPA scores between the PPT section \((N = 14)\) and the WB section \((N = 21)\) revealed no difference between course sections at the start of the fall semester (PPT M = 3.31, SD = .42; WB M = 3.35, SD = .37). A comparison of final course grades and final exam grades for each section are illustrated in Figure 2. Independent sample \(t\)-tests were conducted to analyze differences between sections regarding the final exam grades, final course grades, and overall GPA. These tests revealed no significant difference in grades across course sections: final exam \([t(44) = -.51, p = .61]\), final course...
grade \( t(46) = 1.19, p = .24 \), and overall GPA \( t(33) = .28, p = .78 \).

**Instructor Behavior**

Descriptive statistics were performed to analyze the percent of class time the instructor used the whiteboard to deliver content in the WB section and the percent of class time that the instructor used PowerPoint slides to deliver content in the PPT section. Examination of the data confirmed the use of the two different media for delivering content as intended. The instructor spent relatively the same amount of total class time teaching content in the WB section compared to the PPT section. Similarly, the overall behavior of the instructor was very similar in each section. Refer to Figure 3 for a graphical representation of the descriptive statistics for all instructor behaviors. Independent sample \( t \)-tests were conducted to analyze differences between sections on percentage of class time spent in individual categories and combined categories. These tests revealed a significant difference in two categories: the percent of class time spent instructing using the WB \( t(14) = 9.38, p = .00 \) and the percent of class time spent instructing using PPT \( t(14) = 10.89, p = .00 \). These results confirm that the two sections were taught using two different methods of content delivery. Additionally, descriptive statistics and independent sample \( t \)-tests were conducted to compare percent of class time spent in various instructor behavior categories between the two sections (See Figure 3 for descriptive statistics). Results revealed no significant differences in instructor behaviors categories across the two sections: instruction modeling \( t(14) = -.35, p = .73 \), instruction only \( t(14) = 2.18, p = .05 \), non-verbal instruction using the whiteboard \( t(14) = 2.05, p = .06 \), percent of class time waiting \( t(14) = .25, p = .81 \), percent of class time telling anecdotes \( t(14) = -.66, p = .52 \), percent of class time spent reviewing \( t(14) = -1.72, p = .11 \), percent of class time introducing new content \( t(14) = 1.77, p = .10 \), total amount of instructional time \( t(14) = \)

![Means and Standard Deviations](image)

**Figure 3. Instructor behavior means and standard deviations.**
- .26, \( p = .8 \)], total percent of class time in instructional categories \([t(14) = .91, p = .38]\),
total percent of class time in episode categories \([t(14) = 1.17, p = .38]\), total percent of
class time in content categories \([t(14) = .33, p = .74]\), anecdotes rate per class \([t(14) = -.97, p = .35]\),
total rate of teacher questions per class \([t(14) = .06, p = .96]\), and total rate of
open and closed content questions per class \([t(14) = .42, p = .68]\).

**PowerPoint Usage and Content**

Descriptive statistics revealed total PowerPoint slide usage (per class) in the WB section
(M = 3.22, SD = 4.63) to be lower than the total PowerPoint slide usage (per class) in the
PPT section (M = 31.00, SD = 18.92). Additionally, independent \( t \)-tests were used to
compare PowerPoint usage and PowerPoint slide content between the two sample sections.
These tests revealed a significant difference between the two sample sections in
amount of text per slide \([t(14) = -4.08, p = .001]\) and text and picture per slide\([t(14) = -4.73, p = .00]\), confirming the method of content delivery was different between the two
sections. No significant difference was found in the amount of pictures per slide \([t(14) = -1.23, p = .24]\), or video per slide \([t(14) = -.18, p = .86]\). This was because the instructor
showed the same pictures and videos in each section of the class.

**Discussion**

There is an increasing interest in collecting information regarding instructional practices
and student engagement in college courses (Smith et al., 2013), as well as an investment
to increase overall student success in postsecondary education (Kuh et al., 2006). Upon
analyzing the effect of different content delivery media on student engagement, student
outcomes, and instructor behavior, it was found that there were no significant differences
between the two sections of a Biomechanics course in this study. Overall, the results il-
strate that even though different media can be used to deliver the same content, the dif-
ferent instructional approach does not necessarily result in a change in interaction be-
tween the instructor and student, or between the student and the content, or differences in
student learning.

**Student Engagement**

The students exhibited similar behavior in both of the sections of the course and main-
tained engagement in relatively similar ways. The different instructional media did not
translate to a significant difference in student behaviors representative of engagement
(i.e. content interaction) or in behaviors representative of student disengagement (i.e. off-
task).

**Student Learning Outcomes**

While small differences exist between sections regarding student grades on exams,
homework, quizzes, and GPA, \( t \)-tests showed that these variables were not statistically
significant. Therefore, regardless of section, students performed similarly on course as-
signments and had similar GPAs at both the start and end of the course. Using a different
medium to present content did not affect student outcomes differently in the PPT section compared to the WB section.

**Instructor Behavior**

Observation of the instructor behaviors indicate that the instructional medium used to deliver content did not lead to differences in overall instructor behavior. Essentially, using the whiteboard or PowerPoint to deliver content represented two ways to present content and did not affect how the instructor behaved or interacted in each section. Regardless of the delivery, no significant difference in teacher behavior exists regarding time spent instructing in each section, the amount of questions asked per section, type of question asked per section, amount and type of modeling per section, amount and type of anecdotes per section, etc. This illustrates that changing the media to deliver content does not change instructor behavior between sections of this specific course.

**PowerPoint Usage and Content**

As intended, the PPT section was taught predominantly with the use of technology (PowerPoint presentation and slides) as the main medium for delivering content. Although the WB section did include occasional complementary PowerPoint slides, it was taught using minimal technology, with the content delivered to students predominantly through a traditional whiteboard medium. The data support a difference in the delivery and usage of media by the instructor; however, the insignificant differences in student engagement and student learning outcomes indicate the students received the content of the course in the same manner across both sections.

**Limitations**

The data in this study were collected only during the lecture section of the Biomechanics course. In addition to attending the lecture sections twice a week, students also attended a one-hour lab section once a week. The intent of lab was to apply content learned in the lecture classes in a smaller setting through active learning. No observations or data were collected from this lab section. Different instructional strategies and/or methods of content delivery may have been implemented in this lab section, which could have influenced the engagement of students in the lecture sections. Students engage more in learning when they are able to make a connection between the content learned in the classroom and real life (Lukowiak & Hunzicker, 2013). It is unknown whether this connection occurred more extensively during the lab section and subsequently, if this had any effect on engagement, learning, outcomes, and/or instructor behavior in the lecture sections.

**Implications**

Observational data alone should not be used as a measure of teaching quality or efficacy and “any attempt to assess instructional quality should be based on a variety of measures and data sources, including student outcomes” (Hora & Ferrare, 2014, p. 40). According-
ly, this study was not intended to measure the teaching effectiveness of the instructor, but rather was intended to compare the effectiveness of one instructional medium with another. The objective data and results are meant to help inform teaching practices and provide a comparative glance into the effect of two mediums for delivering content on various constructs of student learning.

As indicated in the results of this study, changing the media in which an instructor delivers content does not necessarily translate to greater student learning outcomes. The focus needs to shift more towards how the students are engaged in the content, which in turn will provide more information on the extent to which learning is potentially taking place. The results of this study do not place one medium as more or less effective than the other, which reinforces the concept that content can be presented through different media and achieve the same outcomes in terms of behavior, engagement, and learning outcomes.

The findings from this study can also be used to inform professional development opportunities. Educating and encouraging instructors to implement more interactive and active teaching methods will assist them in fostering student engagement and lead to student achievement in the college setting (Lane & Harris, 2015; Smith et al., 2013; Wieman & Gilbert, 2014). Additionally, PowerPoint dependent instructors may find comfort in branching out to explore other delivery methods, even more interactive ones, if they know that they can present the same content with a different media and have students achieve the same outcome. In their comprehensive literature review, Kuh et al. (2006) highlight a number of pedagogical approaches that are known to be effective in promoting student success: active and collaborative learning, classroom-based problem solving, peer teaching, instructional technology, service-learning, reciprocal teaching, and concept-knowledge mapping (p. 67). If student engagement is known to be one of the most important factors in student learning during college (Hu & Kuh, 2002; Smith et al., 2013), it is vital for instructors to look beyond their own behaviors in the classroom and evaluate the impact that their practice has on the students, not only in terms of how content is being received, but also in terms of how students are engaged with the material. Instructors that are committed to creating a student-centered learning environment and developing an engaging pedagogical practice can play a critical role in improving student learning in college courses (Kuh et al., 2006; Lane & Harris, 2015; Smith et al., 2013).

References


*The Journal of Effective Teaching, Vol. 16, No.1, 2016, 5-18*

©2016 All rights reserved.


Using Open-Book Exams to Enhance Student Learning, Performance, and Motivation

Steve G. Green, Claudia J. Ferrante, and Kurt A. Heppard
USAF Academy, CO 80840

Abstract

This study investigated an alternative testing protocol used in an undergraduate managerial accounting course. Specifically, we assert that consistent open-book testing approaches will enhance learning and better prepare students for the real-world decision-making they will encounter. A semester-long testing protocol was executed incorporating a mix of open-book and closed-book pre-quizzes, and open-book major exams. Findings indicated that students taking open-book pre-quizzes performed better on open-book final exams, but not other major exams. Our research approach also revealed preliminary indications that our students value their textbooks more, and used them more frequently and extensively, to prepare for class using open-book testing protocols as opposed to using traditional closed-book testing procedures. Also, preliminary indications reveal that alternatives to traditional closed-book testing enhance student satisfaction with courses and textbooks, and provide the potential to improve students’ experiences in the workplace. We encouraged future quantitative studies with robust research designs dedicated to addressing these preliminary indications and provide several suggestions for future research.

Keywords: Open-book exams, closed-book exams, assessment, assurance of learning, education.

Among educators, an excellent way to incite a debate is to discuss the strengths and weaknesses of any particular testing protocol. In an era of unprecedented change to the educational landscape, including curricula innovations, new approaches to teaching and assessment, and an emphasis on process improvement have created an environment that is often referred to as learning-centered (Ramaley & Leskes, 2002). Additionally, the proliferation of distance education and the abundance of credible on-line degree and certification programs have highlighted student interest and motivation.

In this dynamic educational environment there has also been an increase in concerns about testing protocols, addressing learning outcomes, and assessment of student performance (Yang & Cornelious, 2005). These realities coupled with the inexorable transition from traditional pencil-and-paper exams to computer-mediated exams have authors investigating many different aspects of various new testing protocols including; test anxiety, preparation, and how students feel about various exam modes (Alltizer & Clausen,
With alternative educational approaches, there are often concerns about cheating and plagiarism (Damast, 2007) and discussion on how to address them (Williams, 2006) continue as well. These pressures for transformation have also motivated educators to investigate a wide variety of improvement opportunities including testing, assessment, and assurance of learning. We feel examining open-book exams, and making the findings available, will encourage educators to investigate and identify opportunities for educational process improvement.

**Testing, Assessment and Assurance of Learning**

Approaches to assessment are as varied as the educators that use them, and the academic disciplines they represent. The act of “grading” was long-viewed as the best, or at least adequate, means of assessing students’ learning. As researchers consistently determined that tests and quizzes measure retention as well as knowledge (Roediger & Karpicke, 2006a), and as the educational landscape continued to change, performance measurement with alternative forms of valid assessment became the holy grail for educators.

For many business schools, a major change occurred with the passage of the Association to Advance Collegiate Schools of Business International’s (Association to Advance Collegiate Schools of Business International [AACSB International], 2007) standards and requirements for a more structured approach to assurance of learning and the outcomes assessment process (Anderson-Fletcher, 2005). These new AACSB standards forced a re-examination of educational processes at business schools and encouraged teachers to continuously improve the quality of education. At our institution, we are keenly interested in investigating improvements to our educational processes and encourage sharing results with the academic community.

Our investigation of the relatively unorthodox assessment approach of using open-book exams is an excellent example of an attempt to enhance learning by continuously improving our educational processes in the spirit of the AACSB standards. Specifically, our study investigated whether consistent open-book testing would improve student performance on major exams and ultimately better prepare our students for real-world operational decision-making environments they will encounter. It also examined whether open-book testing would improve students’ overall satisfaction with courses, justification of required textbooks, and enhanced motivation to learn.

**Significance**

From a general education perspective, there is an ongoing movement to help students become “intentional learners” who are capable of adapting to new environments, integrate disparate knowledge, and experience continuous learning throughout their lives (Ramaley & Leskes, 2002). For the last two decades, practically all stakeholders in the educational process have been demanding that the educational community constantly search for improvements to student learning and success (Barr & Tagg, 1995). Given the exponential growth in readily available knowledge, the assertion that technology is making information increasingly easy to access is also significant. This changing tech-
nology has had an important influence on pedagogy as students’ behavior transform and adapt to contemporary realities such as digital textbooks or e-textbooks (Weisberg, 2011).

At our university, the United States Air Force Academy (USAFA), we feel the use of open-book exams may align better with our stated learning objectives and the technology that our students access. More importantly, we feel open-book exams will be more representative of the professional setting our students will encounter upon graduation. Investigation of the benefits of open-book exams will address in part the persistent call for relevance and “real world” application (Collett, 2000) in higher education. Our study addresses and compliments many academia-wide initiatives on this topic.

Our premise is that traditional time-proven pedagogy, instructional activities, and assessment techniques might not be optimal approaches for all disciplines. Specifically we feel this may be true for our study involving the relatively structured discipline of managerial accounting. In a contemporary dynamic workplace, we feel decision-making is essentially an “open-book” activity where managers do not rely upon memorized information to act effectively. There are many professional bodies that agree with this premise. For example, in 2005 the National Association of Communication Systems Engineers (NACSE) call closed-book testing “archaic” and “not reflective of the real world” and subsequently changed its certification examinations and training to open-book testing (Sosbe, 2005, p. 4).

For years the same growing void that we recognized in education and practice has also been identified in the accounting community (Albrecht & Sack, 2000), and has been extensively documented (Apostolou, Watson, Hassell, & Webber, 2001), researched (Paisey & Paisey, 2004; Phillips & Phillips, 2007), and promulgated (Accounting Education Change Commission [AECC], 1990, 1992). Stakeholders, such as students and employers, have exasperated the so-called capabilities-gap, by demanding what they want from higher education and the realities of what universities can provide. As a result, formal outcome assessment of accounting programs has become increasingly significant as accreditation bodies require evidence of assurance of learning (AACSB, 2007).

Similarly, we feel that the type of learning the undergraduates at our institution experience can improve if we attempt to replicate the modern dynamic workplace they will encounter after graduation. Therefore we contend that open-book exams would be a closer representation to what graduates would encounter “on the job” including for example being a pilot, program manager, or an accountant. Feller (1994) felt closed-book exams test what students can memorize while open-book exams better represent real-life situations where considerably more resources are available. Granted, a pilot needs to memorize certain emergency procedures. However, since each emergency a pilot might encounter is by definition unique, they must be able to assess the situation and adapt appropriately. Even if our graduates do not fly, to improve learning, we assert that consistent open-book quizzing and examination protocols will better prepare students for the real-world operational decision-making they will encounter.
Open-book testing also addresses the discontent associated with textbook purchase for courses. Students get frustrated when they pay large sums of money for textbooks that are either sparingly used during a course, or find that success in the course is not dependent on their use of the textbook. Students spend billions of dollars each year on textbooks with legitimate complaints of too frequent revisions and needless bundling. There are reports that textbook prices tripled from 1986-2004 (US Government Accountability Office [GAO], 2005). Economic realities have undoubtedly forced some students to choose courses based on whether a textbook is required or even based on the cost of the textbook. Authors are addressing this textbook crisis by studying alternatives to required textbooks such as library reserves (Pollitz, Christie, & Middleton, 2009). Finally, the federal government has tried to alleviate some of the textbook cost burden by increasing direct aid and suggesting that textbook costs be tax deductible for eligible filers (Supiano, 2009). We argued that there are few better ways to illustrate the value of an expensive textbook than to allow students to reference it during open-book exams, and optimally retain it for future use.

Finally, we believe there may be valuable insights into open-book testing protocols that many educators may have dismissed in the past. We feel this is especially true in education communities that culminate the learning experience with closed-book computer-based certification tests such as the Certified Public Accounting (CPA) and Certified Management Accounting (CMA) exams. However, even as educators embraced computer-based exams in their courses as improvements to their assessment portfolios, research indicated no significant difference in student performance on computer-based exams versus traditional paper-based tests (Anakwe, 2008). We feel by including open-book exams into their assurance of learning repertoire, whether they are computer-based or traditional paper-based, educators will likely enhance student learning while addressing the needs of future employers.

**Study Landscape**

Curriculum improvement is an integral part of the mission of our institution, USAFA. We are very circumspect as to how we select and how we approach our improvement efforts. We take great strides to ascertain that any study that directly involves students receives particular scrutiny. The design of this experiment ensured that our learner-focused institutional goals and objectives were not compromised, our assurance of learning and assessment processes were enhanced, and our students received equitable treatment regardless of the testing methodology. To accomplish this we offered all of the major exams, including the final exam, for every student in the course, in an open-book format. We used the pre-exam quizzes solely as the testing vehicle and alternated open-book and closed-book versions depending across sections of the course. Also, the pre-exam quizzes represented only 10% of their course grade ensuring that motivation for accomplishing the pre-exam quizzes existed, but the overall impact on the final grade was nominal.
Review of the Literature

Since assessment is not unique to any specific academic discipline, the review of the literature on open-book versus closed-book testing we chose was somewhat eclectic. We relied upon a broader education-oriented body of knowledge for relevant discussions of open-book and closed-book testing protocols. However, we feel this approach enhanced rather than diluted any finding or indications associated with the study.

Numerous research efforts across several different academic disciplines have studied, measured and reported on the efficacy of open-book versus closed-book exams. A cross-disciplinary review of the literature appears to be inconclusive as to whether “better” learning occurs, varied on whether “better” preparation occurs, and consequently is diverse on which approach is superior. For example, in an introductory biology course, Moore and Jensen purported that open-book exams actually impede long-term learning (2007). For an introductory statistics course, Block (2012) discovered that in addition to a reduction in anxiety, the use of open-book exams increased student enjoyment while encouraging deeper student learning. Also, a new dimension was investigated in several psychology courses with the addition of “cheat-sheets,” or student produced notes that are available during an exam. Results showed that students performed slightly better on open-book exams versus closed-book exams, but for students that predicted they would do better with open-book versus cheat-sheets, the authors found no difference between the two groups (Gharib, Phillips, & Mathew, 2012).

Open-Book versus Closed-Book Exams

The closed-book exam is an established approach to assessment in higher-education. It is both widely accepted by educators and frequently used (Theophilides & Koutselini, 2000) and basically tests how well a student uses the knowledge they can recall with no additional material available for use on the exam. On the other hand, open-book exams allow students to consult textbooks, notes, and other course–related material during the exam. Some educators may consider open-book tests less conventional, but they have gained popularity across the entire spectrum of education including primary, secondary, and higher education (Baillie & Toohey, 1997; Eilertsen & Valdermo, 2000). Impediments to widespread adoption of open-book exams in studies include indications that students spend considerable time looking for an answer instead of formulating their answers, and that open-book exams result in a reduction of preparation time in studying (e.g., Boniface, 1985; Rakes, 2008; Theophilides & Koutselini, 2000). Also, Agarwal, Karpicke, Kang, Roediger, and McDermott, (2008) reported mixed findings relative to long-term or delayed retention of material. This behavior is complicated by changes in students’ study-behavior based on their expectancy of an open-book exam and its impairment on long-term retention (Agarwal & Roediger, 2011). While our study did not address the issue of student expectancy, it is an important issue to address in future studies given its impact on student performance in other studies.

The literature suggests that open-book exams may need new instructional techniques that address different cognitive processes and knowledge levels. For example, open-book ex-
ams might need designs that give students every opportunity to demonstrate their knowledge level and what they can accomplish in the time allotted. Feller, (1994) recognized that teachers will have to pay more attention to teaching the higher-level skills which includes conceptualization, problem solving, and reasoning. This is not a new dilemma by any means. Some of the earliest writings on the subject highlight issues with open-book exams including that they will likely reduce study by allowing students with a false sense of security that will allow them to “slide through” with minimum study (Kalish, 1958). Also, the advent of the various forms of personal computers, search engines, and other trappings of an information-rich classroom environment, have created changes in pedagogy. Improvements to this aspect of education represents another educational research opportunity including “open-book, open-web” (OBOW) testing protocols (Williams & Wong, 2009).

In general, the relevant literature varies greatly in its orientation and can be categorized by measurement of student performance, assessment of student learning, and identification of various behavioral effects on students such as exam preparation and test anxiety. This study attempted to address each of these aspects of the open-book versus closed-book exam debate.

**Measurement of Student Performance**

As previously referenced, Kalish’s (1958) early investigations into the potential impact of open-book exams addressed the contention that the opportunity to look up material at its source should provide greater accuracy of response than depending upon memory. While this position was not specifically validated, the fact that open-book exams measured different abilities was verified and this encouraged future study (Kalish, 1958).

Differences in student performance was also noted when the exam format changed. For example, students who took open-book exams the entire semester experienced significantly lower grades on closed-book final exams relative to those who took closed-book exams the entire semester (Moore & Jenson, 2007). In a more recent study, student judgements of comprehension were higher when students benefited from being able to use the open-book format (Ackerman & Leiser, 2014).

Using examinations that were specifically designed to test critical thinking and higher-order skills, Ioannidou (1997) compared results of students taking open-book versus closed-book exams. She concluded that there was no significant difference in the scores of students taking open-book versus closed-book exams, and found that students that expect an open-book test might have less study motivation (Ioannidou, 1997). Other studies directly assert that student performance is actually worse on open-book exams (Boniface, 1985).

**Assessment of Student Learning**

While assessing learning is important, many feel that tests can do more. Exams can enhance learning while also improving long-term retention (Roediger & Karpicke, 2006b).
The question becomes not if tests are beneficial, but test implementation. For example, Agarwal et al. (2008) found that open-book testing recorded better initial performance, but the benefit did not continue. Others have stated that closed-book final exams do not adequately measure deep conceptual understanding. Williams’ (2006) position is that closed-book final exams encourage “cramming” and “data dumps” and suggest that closed-book invigilated exams have become anachronisms.

This phenomenon is described in the education literature as deep versus surface learning (Entwhistle, 1997). In general, we feel deep learning is best for contemporary students, and open-book testing has been identified as an excellent means to stimulate deep learning. However, even recognizing this deep learning versus surface learning perspective, researchers in the field of medical education found opposite results. Heijne-Penninga, Kuks, Hofman, and Cohen-Schotanus (2008) determined that closed-book tests stimulated deep learning more than open-book exams partially because students had more motivation to study for closed-book exams. In a related study, Heijne-Penninga, Kuks, Schonrock-Adema, Snijders, and Cohen-Schotanus (2008) suggested that by breaking the vast amount of medical information into core knowledge and backup knowledge, open-book testing complements closed-book testing and would be useful for assessment programs.

Another educational philosophy referred to as Constructionist Learning, contends knowledge is created by the students’ learning activities, not necessarily transmitted by direct instruction. Constructionists argue that learning will occur only when the learner is actively engaged (Williams, 2006) and we feel that open-book testing enhances engagement. Constructivism focuses on knowledge construction, not knowledge reproduction (Herrington & Standen, 2000). We also feel this position supports open-book testing.

Williams and Wong (2009) argue that open-book exams are more authentic and more constructively aligned with stated learning outcomes. Their position is that closed-book exams are anachronisms given the needs of a knowledge economy and the incompatibility with constructivist learning theory (Williams & Wong, 2009). We also feel open-book exams compliment this educational philosophy.

Eilertsen and Valermo (2000) viewed open-book tests as a means to encourage thinking at higher cognitive levels and promote study and teaching methods. One of their preliminary findings was that open-book exams stimulate learning and noted that the test itself could be an arena for learning (Eilertsen & Valermo, 2000).

The field of managerial accounting recognized the changing role of the practitioner that requires a new skill set and approach to problem-solving (Siegel & Sorenson, 1999). Educators in the accounting community can potentially benefit from considering findings from Albrecht and Sack (2000) that a rule-based memorization for certifying exams is inefficient and do not prepare students for the business world. In a landmark study performed by Albrecht & Sack (2000), one participating accounting educator stated:
An accounting student needs to know that there are technical rules and regulations. He or she doesn’t need to be able to tell me what FAS 124 is. I don’t even know what FAS 124 is, but if I need to know it, I know where to get it. (p. 37)”.

As higher education embraces on-line pedagogy, an additional question of how the internet supports learning and how teachers best assess learning looms. Some feel that learning is fundamentally a social process and as our culture and technology evolve, so must higher education. Preparing students to answer fact-based multiple-choice questions by rote memory is not adequately preparing them for future careers. The key is to develop instructional approaches that foster innovation, creativity, and independent thinking (Bruckman, 2002).

**Behavioral Effects on Students**

There is considerable discussion as to whether students’ grades are strongly associated with “good” academic behavior. Educator should engage in activities that promote good academic behaviors, but Moore and Jenson (2007) found indications of the opposite occur. They found that compared with student facing a closed-book exam, students with a scheduled open-book exam were less likely to attend class and help sessions, or submit extra credit assignments (Moore & Jenson, 2007). The results also indicated that students preparing for a closed-book exam tended to postpone their study until the end of the semester and focused on the memorization of material in the textbook (Moore & Jenson, 2007).

Theophilides and Koutselini (2000) found that students studying for open-book exams tended to review various sources and integrated the information they reviewed. Further, during the open-book exam, students worked creatively and “probed deeply” into the material (Theophilides & Koutselini, 2000). Phillips found that open-book exams improved study skills by constructing tests with contextual clues that helped students effectively identify correct answers in the text (Phillips, 2006).

Open-book exams also compliment a learner-centered approach to education. For example, the reduction in the level of anxiety of an open-book exam, whether warranted or not, may be a result of more comprehensive exam preparation and more consistent learning environment with students avoiding “cramming” (Theophilides & Dionysiou, 1996; Theophilides & Koutselini, 2000).

However, we also recognize additional complex behavioral issues and possible negative impacts of open-book exams that other authors have identified. For example, the use of open-book exams may require professors to ask questions on cognitive levels beyond recall including conceptualization, problem solving, and reasoning (Feller, 1994). It might also add an additional burden on the instructor since creating effective and valid open-book exams requires a professor to expertly create an open-book exam. Anecdotally, students may engage in a race to see how quickly they can find answers to an open-book exam, as opposed to a guessing game of what questions they will face on a closed-book exam that should be committed to rote memory. The perceptions of harder questions and
second-guessing the instructor might create anxiety for some students. In any case, these behaviors do not create optimal learning environments, but when recognized, can be mitigated.

Our study hopes to add value to the rich open-book versus closed-book exam debate in an effort to decrease the gap between the knowledge that our students obtain in courses, the skills they develop when taking our exams, and how they will eventually perform in an operational setting.

The Study

Our study investigated whether an open-book versus closed-book testing protocol significantly impacted students’ performance on major exams and their attitudes regarding the textbook and the course. Specifically, we hypothesized:

**H1:** Students taking open-book pre-exam quizzes will perform better on open-book exams than students taking closed-book pre-exam quizzes.

**H2:** Students taking open-book pre-exam quizzes will see clearer links between the textbook and course material and believe they learned more in the course than students taking closed-book pre-exam quizzes.

Methodology

Students in our undergraduate introductory managerial accounting course experienced a semester-long testing protocol incorporating either open-book or closed-book pre-exam quizzes to prepare for three major open-book exams during the semester. The final exam was also an open-book exam. This offering is a required course for all undergraduate Management Majors at our AACSB-International Accredited business program and represented one of the largest sample populations available. Second, as mentioned earlier, the accounting educational community has aggressively embraced alternative assessment studies such as ours and suggest improving introductory accounting courses with pedagogy that emphasized increased student involvement in the learning process (AECC, 1990; 1992). Third, the course had a robust set of learning objectives which could be utilized in future studies to measure students’ achievement of learning objectives between testing protocols.

The total sample size consisted of 235 students across ten separate sections of the course taught by four instructors. One-half of each of the four instructors’ sections of students prepared for each of the three open-book major exams with two open-book pre-exam quizzes, while the other sections of students prepared for these major exams with closed-book pre-exam quizzes. Each instructor ensured that students’ grades would have no impact by the testing protocol they experienced, and that there was no advantage for being a student in either protocol. The students in the two testing protocols took similar pre-exam quizzes and major exams (i.e., similar conceptual questions with different numbers) and the same final exam.
Upon completion of the course, all students completed a survey of questions investigating their attitudes toward open-book testing and its relationship to the course, its textbook and learning. The survey instrument was the same for all instructors. Students responded to each statement using a 5-point Likert-scale where 1 was strongly disagree and 5 was strongly agree. The statements examined whether students saw clear links between the materials covered in the textbook readings and class lectures, if the exams were closely related to the textbook, if students recommended the open-book testing approach, and if students’ instructors provided suggestions on how to effectively use the textbook. Additional questions surveyed students as to whether they spent more time working problems or exercises in the textbook, or more time preparing the textbook for use as reference during the exam to prepare for the open-book exams, and whether they felt they learned more or less using the open-book testing approach. Finally, the survey asked if they had a false sense of security in preparing for the open-book exams.

Results

We used PASW Statistics 18 to analyze our data (See Table 1). Our findings indicated that students who took open-book pre-exam quizzes did not perform significantly better on any of the three open-book major exams than students who took closed-book pre-exam quizzes. However, students who took open-book pre-exam quizzes did perform significantly better on the open-book final exam than students who took closed-book pre-exam quizzes. As might be expected, students’ performance on the open-book final exam was significantly impacted by their performance on the three open-book major exams. Thus, these findings only partially supported our first hypothesis.

In examining the survey data, we did find significant differences between students in the open-book versus closed-book pre-exam quiz sections. Specifically, students in the open-book sections more strongly agreed that they saw clear links between materials covered in textbook readings and class lectures (M = 4.32 for open, 4.12 for closed) and the exams were closely related to textbook (M = 4.18 for open, 3.99 for closed) than students in the closed-book sections. The open-book students also more strongly agreed that their instructor provided suggestions on how to effectively use the textbook (M = 4.04 for open, 3.82 for closed). Although there was not a statistically significant difference between open-book and closed-book students and their recommendation of the open-book testing method, 82.6 percent of the students strongly agreed or agreed with the statement “I recommend the open textbook method for other classes (M = 4.26)”.

Although not statistically significant across our open-book versus closed-book testing protocol, 51.3 percent of students said they spent more time working problems/exercises in the textbook to prepare for the open-book exams, whereas 48.7 percent of student said they spent more time preparing the textbook for use as reference during the exam. Eighty-eight percent of students felt they learned more using the open-book testing approach with no statistically significant difference between students in the open-book versus closed-book sections. We did find a statistically significant difference between students in the open-book and closed-book sections and their having a false sense of security in preparing for open-book exams. Specifically, although 70.5 percent of all students
Table 1. Means, Standard Deviations, and Correlations.

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Open book quizzes; 0 = no, 1 = yes</td>
<td>.49</td>
<td>.50</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Quiz 1</td>
<td>8.71</td>
<td>1.69</td>
<td>.07</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Quiz 2</td>
<td>5.96</td>
<td>2.09</td>
<td>.05</td>
<td>.06</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Quiz 3</td>
<td>6.77</td>
<td>2.33</td>
<td>.05</td>
<td>.06</td>
<td>.13*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Quiz 4</td>
<td>7.06</td>
<td>2.32</td>
<td>.28***</td>
<td>.18***</td>
<td>.14***</td>
<td>.22***</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Quiz 5</td>
<td>5.91</td>
<td>2.39</td>
<td>.04</td>
<td>.14***</td>
<td>.14***</td>
<td>.11*</td>
<td>.15***</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Quiz 6</td>
<td>7.08</td>
<td>2.23</td>
<td>.10</td>
<td>.09</td>
<td>.05</td>
<td>.01</td>
<td>.27***</td>
<td>.09</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Exam 1</td>
<td>76.55</td>
<td>10.15</td>
<td>.01</td>
<td>.25***</td>
<td>.05</td>
<td>.21***</td>
<td>.01</td>
<td>.17***</td>
<td>-.01</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Exam 2</td>
<td>75.69</td>
<td>12.39</td>
<td>.03</td>
<td>.26***</td>
<td>.10</td>
<td>.09</td>
<td>.26***</td>
<td>.21***</td>
<td>.22***</td>
<td>.21***</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>10. Exam 3</td>
<td>80.86</td>
<td>10.33</td>
<td>.01</td>
<td>.26***</td>
<td>.15***</td>
<td>.17***</td>
<td>.08</td>
<td>.21***</td>
<td>.07</td>
<td>.41***</td>
<td>.40***</td>
<td>.46***</td>
</tr>
<tr>
<td>11. Final Exam</td>
<td>194.31</td>
<td>23.07</td>
<td>.12*</td>
<td>.20***</td>
<td>.15***</td>
<td>.18***</td>
<td>.26***</td>
<td>.21***</td>
<td>.17***</td>
<td>.36***</td>
<td>.40***</td>
<td>.46***</td>
</tr>
</tbody>
</table>

NOTE: N = 235.
* p < .10. ** p < .05. *** p < .001.

indicated they did not have a false sense of security in preparing for the open-book exams, students in the open-book sections had less of a false sense of security, as the mean for students in the open-book sections was 0.23 and 0.36 for students in the closed-book sections (where 0 was ‘no’ and 1 was ‘yes’). Thus, our students did not possess overconfidence in preparing for the open-book exams.

Findings and Discussion

Although we found only partial support for our hypothesis that open-book pre-exam quizzes would significantly increase students’ performance on open-book major exams, we believe our study was successful in demonstrating usefulness of this testing protocol. Specifically, students like the idea of open-book exams, but not necessarily for the reasons educators might think. Anecdotally, students indicated they learned more through the open-book testing approach than they do through the conventional closed-book approach regardless of their grades on the assessments, because they were able to focus on mastering concepts to solve the accounting problems rather than memorize technical aspects they could look up in the textbook. Further, they also indicated they did not have a false sense of security going into the open-book exams, as they knew they would have to be able to work through the problems and apply concepts rather than simply report facts from the textbook, as well as having a time-constraint. These findings can provide a foundation for suggested open-book exam “best practices.” The key to successful implementation and increased student learning rests with how well the open-book testing protocol and process are described to the students. Also, best practices might include effort to ensure instructors are as unified as possible in their desire to investigate new approaches to enhancing student learning.

Conclusion and Suggestions for Future Research

In our quest to prepare our students for careers in the “open-book world” they will encounter after graduation, we believe open-book exam approach is useful for enhancing student learning while effectively preparing our students for real-world operational deci-
sion making. Even though our study did not answer the proposition of whether open-book testing encourages life-long learning in students by enlightening them that they do not need to “know” all the answers, we still feel that referring to source material for guidance is an attribute. There were indications that open-book testing encouraged active student engagement in their learning, and in many cases expanded their confidence in being able to work through difficult concepts. This as well as several other areas warrant further investigation, and we offer several suggestions for future study.

First and foremost, it would be beneficial to conduct a follow-on study in which the open-book versus closed-book treatments are carried throughout the entire course with all the instructors. Additionally, even with over 250 students, in our opinion, we did not have enough subjects to warrant the multiple experimental treatments; open-book and closed-book pre-exam quizzes crossed with open-book and closed-book exams. Specifically, we recommend having one-fourth of the students in a large population course experience the following treatments: open-book pre-exam quizzes and open-book exams, closed-book pre-exam quizzes and open-book exams, open-book pre-exam quizzes and closed-book exams, and closed-book pre-exam quizzes and closed-book exams. We believe this approach would accommodate a more robust study and may produce significant findings.

It would also be very interesting to conduct longitudinal studies of students at various levels of academic experience and development. These longitudinal studies offer the promise of understanding open-book preparation and performance differences for students with different levels of experience and academic maturity. Well-constructed longitudinal studies could also follow specific students throughout their academic careers to evaluate possible effects the open-book methodology has on student development and performance. These longitudinal studies can also give greater insight into possible negative impacts of open-book exams on student learning and performance. For example, mixed findings have been reported regarding long-term or delayed retention of material covered in open-book exam approaches (Agarwal et al., 2008). Longitudinal studies are important as these long-term effects of the methodology are more carefully studied and reported.

Many other potential research opportunities in the study of open-book exams exist. Educators agree that open-book exams reduce anxiety, and students appear to consistently prefer open-book exams despite the acknowledge understanding that they generally require the exhibition of higher-order thinking skills (Brightwell, Daniel, & Stewart, 2004). However, as discussed earlier, questions might actually be harder on an open-book exam because they are testing at a higher level of learning. Consequently, we suggest pre-test post-test treatments of attitudes associated with this phenomenon. Also, although open-book exams do not necessarily lead to higher achievement in terms of test scores, they do seem to reduce unnecessary rote memorization of facts which allows students to prepare for exams more constructively (Theophilides & Dionysiou, 1996). We did not specifically address this phenomenon, but recognized it during our study and suggest future investigation.
Open-book exams may also need new instructional techniques that address different cognitive processes and knowledge levels. In other words, perhaps studies should be conducted on the manner in which a student approaches a problem, based on the open-book versus closed-book experience. Related to this idea, open-book exams may be more difficult to construct (Eilertsen & Valdermo, 2000), and faculty may spend relatively too much time preparing and grading open-book exams while other faculty may also be insufficiently trained or experienced in open-book exam construction (Vanderburgh, 2005). We suggest additional research be oriented toward the instructor, not just the student.

There are also numerous other hybrid options of open-book versus closed-book exam protocols; including an open hand-written note-card approach that show promise in not only high levels of learning but enjoyment of the course (Block, 2012). Research, such as the one conducted by Gharib, Phillips, & Mathew (2012) studying “cheat-sheets” versus open-book or closed-book exams, warrant further investigation.

Finally, as discussed early, no open-book exam study would be complete without properly addressing advancements that are occurring in the on-line education environment. We feel it should not be the ubiquity of the internet that drives the exam approach; it should be a question of if students learn better via open-book exams that also allow access to the internet. We feel that perhaps the richest potential area of study may be to investigate the learning effects of not only open-book exams, but open-computer exams as well. To increase the real-world feel of an exam and to better replicate a future professional work environment, open-book open-computer exams, such as those suggested by Williams and Wong (2009), could be implemented and their impact on learning enhancement studied.

Future research oriented toward addressing these potential research topics will contribute to the ongoing open-book versus closed-book exam debate. These educational process improvement efforts will help address demands that the educational community enhance student learning and success, as well as future professional performance.

We are hopeful that educators in other disciplines find our study useful for their course development. At a minimum, we hope the readers of this study gained insight into a testing protocol they may have dismissed in the past, but now may consider adding to their assurance of learning repertoire in their quest to enhance their students’ learning and future professional success.

References


Using Open-Book Exams to Enhance Student Learning


APPENDIX I

Textbook Survey

Instructions:
In an attempt to enhance learning, we are very interested in your opinion about how we present course material. You are to read each statement and indicate your own personal feelings about the use of textbooks in this course by marking how much you agree with each of the following statements. Using the scale below, fill in the appropriate bubble on your General Answer Sheet.

A
Strongly Disagree
B
Disagree
C
Neutral
D
Agree
E
Strongly Agree

©2016 All rights reserved.
1) I use textbooks to prep for exams in other classes in the same way I am using my textbook to prep for exams in my accounting class.

2) My instructor provided suggestions on how to effectively use my textbook.

3) I use the textbook publisher’s website to supplement the textbook.

4) I see clear links between materials covered in textbook readings and class lectures.
5) Exams were closely related to the textbook.

6) After receiving my score from a graded test, I reviewed the tested material again in the textbook.

7) I recommend the open textbook method for other classes.

8) I plan to sell my accounting textbook at the end of the semester.

9) The price I paid for my accounting textbook was fair.

10) The unremitting and nonsensical use of mildly amusing clipart in class lectures made it difficult to focus on learning objectives from the textbook.

Please provide short answers (not just “yes” or “no” responses) to the following questions in the area provided.

11) What was your strategy for using your textbook in your accounting class?

12) Did you spend more time working on problems/exercises in the text or more time preparing the text for use as a reference during the exam?

13) Do you feel you learned more or less using the open textbook approach?

14) Did you have a false sense of security in preparing for the open-textbook exams? Please discuss why or why not.

15) Please provide any other comments or observations you may have on the use of textbooks in this course.
Strategies for Building Positive Student-Instructor Interactions in Large Classes

Oscar J. Solis¹ and Windi D. Turner
Virginia Tech, Blacksburg, VA 24061

Abstract

Although large classes in and of themselves are pragmatic for universities, they can be challenging for both students and instructors. The purpose of this study was to investigate pedagogical strategies that instructors teaching large classes can utilize to create positive student-instructor interactions to counter these challenges. Both quantitative and qualitative data were collected by means of two online surveys with undergraduate students enrolled in two large consumer studies courses. The data suggested that strategies such as self-disclosure, caring leadership, and making the class feel smaller have positive implications for undergraduate students, faculty, the department, and the university.

Keywords: Large classes, student-instructor interactions, caring leadership, self-disclosure, making the class feel smaller

One of the most practical face-to-face teaching approaches at universities is the longstanding format of an instructor lecturing to large classes. Although pragmatic for universities, large classroom settings present students with many opportunities to become disengaged from learning (Smith, 2001). In a large class, students might perceive that they are just a number—that the instructor does not know their names and will not know if they are in attendance or not. As a result, student attendance begins to dwindle throughout the course (Christopher, 2011). Another perception is that the instructor does not interact with students, but simply stands at a podium or in front of the class and lectures for 50 to 75 minutes.

Despite the growing body of literature on best practices for teaching large classes, there still remains a need to fill the gap between positive student-instructor interactions and student engagement. The purpose of this study was to investigate strategies available to instructors, such as self-disclosure and caring leadership, which can lead to positive student-instructor interactions in large classes. Employing various pedagogical practices and techniques, instructors teaching large classes can make positive connections with their students to make the class feel smaller. The literature has not come to a consensus about how to define what constitutes a large class. Large classroom settings might vary from 50 to 500 students in one course, and the number that qualifies a class as “large” depends on

¹ Corresponding author's email: ojsolis@vt.edu

The Journal of Effective Teaching, Vol. 16, No.1, 2016, 36-51
©2016 All rights reserved.
the individual instructor’s viewpoint (Christopher, 2011). For this article, a large class is defined as up to 150 students being taught by one faculty member or instructor.

**Review of the Literature**

**Self-Disclosure**

Appropriate self-disclosure expresses to students a likeness between the instructor and students (Rocca, 2010). Self-disclosure can either help or hinder students’ communication in the classroom. When students view the instructor’s self-disclosure as being relevant, they are more apt to actively participate in class and ask questions that relate to the course material (Cayanus, Martin, & Goodboy, 2009). Through storytelling, an instructor’s personal stories and experiences can lead to connections with students (Lowenthal, 2008) as the instructor relates to course material and the students’ stories.

Shared by instructors and students, personal and relevant stories can become influential and engaging strategies for teaching and learning. For students, stories can help create meaning out of their experiences (Bruner, 1996; Schank, 1990). These experiences, and the stories that describe them, are key to learning (Schank, 1990; Zull, 2002). In addition, stories enhance memory skills and build bridges to prior knowledge (Schank, 1990). Consequently, students can recall the best stories for later reference (Rex, Murnen, Hobbs, & McEachen, 2002). As Frisby and Martin (2010) explained, “An instructor’s behavior dictates the type of learning environment that is constructed, the type of relationships that bloom, and the academic outcomes that students achieve” (p. 160).

**Caring Leadership**

Caring instructors understand that student learning is affected by negative student attitudes and disruptive behavior; therefore, they set the tone for the class early in the semester. With a clear vision for course expectations, classroom management, and curriculum delivery, an instructor who demonstrates caring leadership will nurture a positive learning environment that promotes student engagement and reduces negativity and disruptions. Researchers have noted key traits among the most effective teachers: the delivery of clear expectations and captivating instruction, the use of evidence-based teaching and classroom management tactics, and an effort to build solid relationships with students (MacSuga-Gage, Simonsen, & Briere, 2012).

In a large classroom, caring leadership is a proven way to enhance the student experience. Caring instructors are respectful of others and have a work ethic that demonstrates a passion for students and the profession. Because an effective classroom environment is built upon motivation and respect, the instructor’s caring attitude promotes and encourages a higher level of commitment from students (Wilson, 2013). For instance, a student who is facing personal or academic challenges will respond to an instructor’s empathy and sensitivity, thus improving the relationship (Bain, 2004). When instructors demonstrate that they are fully devoted to student achievement, students are more likely to reciprocate with deeper engagement, leading to improved communication, trust, rates of satisfaction,
class discussion, and student motivation. Instructors who invest time in relationship-building find that the classroom environment becomes more productive and students become more proactive (Weimer, 2010). Students report higher levels of extrinsic and intrinsic motivation and confidence in their scholastic capabilities when they believe that their instructors are respectful and available (Komarraju, Musulkin, & Bhattacharya, 2010).

**Making the Class Feel Smaller**

Depending on an institution’s academic facilities, the characteristics of a large class’s physical environment—e.g., a lecture hall with a sloped floor, or a room with auditorium seating, or a room with or without a stage, tables, chairs, or desks—can pose mobility challenges for the instructor and students that hinder positive interactions and student participation. Although teacher authority and class size may very well discourage student participation, several techniques can make a large class feel smaller. Interaction between students and instructors outside the classroom setting might lessen obstacles to communication and subsequently nurture overall participation (Weaver & Qi, 2005). This personal communication outside of the formal teacher/student roles formulates an interpersonal relationship that in turn creates respect and trust (Frymier & Houser, 2000). In addition, a caring attitude demonstrated by instructors cultivates a level of commitment from students that drives motivation and discipline, criteria essential for an effective classroom environment (Wilson, 2013). Instructors can show their interest in and support for students by making eye contact and smiling to engage students (Rocca, 2010). These tactics will help build a supportive classroom climate, which repeatedly has been shown to increase participation.

To summarize, effective teaching is far more than having expertise in content and delivery. Instructors must be able to meaningfully engage students with faculty, the content, and their peers in order to be effective in the classroom (Francis, 2012). Student engagement refers to “how involved or interested students appear to be in their learning and how connected they are to their classes, their institutions, and each other” (Axelson & Flick, 2011, p. 38). When instructors express messages of inclusion, appreciation, and willingness to communicate, student engagement is enhanced (Mottet, Martin, & Myers, 2004). Paolini (2015) reported that effective instructors stimulate student learning via discussions, interactive learning, and displaying care and concern for their students’ learning and growth. Effective instructors also create active learning environments by connecting relevant material to their students’ lives. When an instructor in a large class motivates and encourages his or her students to succeed, the students are generally more likely to feel connected to the material.

Goodboy, Myers, and Bolkan (2010) examined the extent to which the five student motives for communicating with an instructor (relational, functional, participatory, excuse-making, and sycophancy) were associated with perceived instructor misbehaviors (incompetence, indolence, and offensiveness). They found that students who perceived their instructors as incompetent were, to some extent, less likely to communicate based on all five motives. This result indicates that students are not interested in getting to know in-
competent instructors, both in and out of the classroom. Mottet, Martin, and Myers (2004) found that students who perceived faculty as using more verbal-approach relational strategies were also more motivated to communicate with faculty for relational, participatory, excuse-making, and sycophantic reasons. Twelve categories were considered as verbal-approach relational strategies: personal recognition, humor, ritualistic, closeness/inclusiveness, self-disclosure, character, willingness to communicate, language appropriateness, honesty, complimentary, responsiveness, and caring/appreciation.

The quality of interaction between a faculty member and a student takes into account the instructor’s compassion, understanding, approachability, helpfulness, responsiveness, and concern, as well as how these traits are perceived by the student. Researchers have found that students are more likely to be academically successful and to engage with instructors who demonstrate leadership skills and are sociable, supportive, intelligent, and objective (Furnham & Chamorro-Premuzic, 2005).

**Materials and Methods**

**Data Collection**

Both qualitative and quantitative data were collected by means of two online surveys with undergraduate students enrolled in two large consumer studies courses in the spring 2015 term at a large research institution situated in the southeastern United States. Because of the descriptive nature of this research, the qualitative data will provide the thick, rich description essential to understanding the importance of positive student-instructor interactions in large classes. The quantitative data will provide matters of measurement and degree of positive student-instructor interactions in large classes. The two authors of this article had dual roles in this study: instructor and researcher. Each author taught one of the two large classes; therefore, they are referred to as instructor-researcher(s).

**Student Perceptions of Teaching (SPOT) Survey**

At the end of each term, the university’s centrally supported method for gathering student perceptions of teaching is available to collect student feedback on courses and instruction. When the online questionnaire opened during the spring 2015 term, an e-mail was sent to students requesting that they complete the survey for each class that they were enrolled in.

There were 138 undergraduate students enrolled in one of the consumer studies classes and 84 students enrolled in the other class, for a total of 222. Ninety-eight (44.1%) students anonymously completed the online SPOT survey consisting of eight Likert-type questions with response options ranging from strongly disagree (1) to strongly agree (6) and one ranging from very bad (1) to very good (6). The survey also included four open-ended questions:

- What did the instructor do that most helped in your learning?
- What could you have done to be a better learner?
• Please add any additional comments regarding the course and/or instructor.
• Please add any comments about the physical environment.

The university administered survey does not include any demographic data. When the survey closed, each instructor-researcher received a report detailing the results that are discussed in the results section. Feedback received from the SPOT survey data highlighted and identified strategies that students perceived to build positive student-instructor interactions. This information was used by the instructor-researchers to develop the questions for the survey Building Positive Student-Instructor Interactions in Large Classes (BPSIILC) online survey.

**BPSIILC Online Survey**

The BPSIILC online survey served two purposes. First, the instructor-researchers wanted to examine the presence of positive student-instructor interactions. Second, the instructor-researchers wanted to explore additional strategies instructors can use in the classroom to build positive student-instructor interactions. In June 2015, an e-mail was sent by the instructor-researchers to students enrolled in both consumer studies courses requesting that they complete the online survey hosted by surveymonkey.com. The e-mail informed students of the purpose of the study, consent information, and a link to the survey. The online survey was distributed after the term concluded; therefore, no extra credit incentive could be offered. However, an incentive of having their name placed in a drawing for one of three gift cards was offered to students for completing the survey. The online survey was open for seven days.

In compliance with the research protocol established by the university and to protect the rights of the participants in this study, institutional IRB approval was secured prior to implementation of the BPSIILC online survey. Sixty-five undergraduate students anonymously participated in this survey of five Likert-type questions and two open ended questions, yielding a response rate of 29.3%. Of the 65 participants, a total of five questionnaires were removed due to incompletion, thus, making the final sample for this study 60 (27%). This response rate is consistent with Sheehan and McMillan’s (1999) report that online survey response rates have a large range spanning from six to 75%.

**Data Analysis**

**Student Perceptions of Teaching (SPOT) Survey**

The instructor-researchers utilized an open coding strategy (Rossman & Rallis, 2011) to independently code the open-ended questions of each survey report to identify common descriptors students were using to describe their experiences in each of these two large consumer studies courses. During a second session of coding, the instructor-researchers jointly reached a consensus on categories. Lists of unique words or phrases were maintained during the coding sessions to allow for category development and to identify quotes for inclusion within the second level of analysis. As the categories were compared to form concepts and eventually develop themes, the instructor-researchers identified
three strategies that promote positive student-instructor interactions in large classes: self-disclosure, caring leadership, and making the class feel smaller.

Self-Disclosure

The SPOT survey responses revealed the theme of self-disclosure which included the following categories: (a) storytelling to relate to course material; (b) disclosing instructor’s personal stories; and (c) sharing peer stories. Selected examples of students’ comments supporting this theme are as follows:

- The instructor explained things very well. The instructor also emphasized and gave us advice that were (sic) very helpful. The instructor even had speakers come in to talk about their financial experiences. In addition, the instructor gave us examples and stories that made me want to take care of my finances. In addition, the instructor’s assignments were very applicable to real life.
- The instructor told some stories to help solidify the importance of what we were learning and that it was important for us to understand.
- The instructor explained things very well and used life experience examples that would happen to everybody. The instructor also related things to the real world and talked about important things that are happening in the news today.
- The instructor was extremely thorough in the course material. The instructor offered personal experiences and situations relative to the topic which eased some challenges in understanding concepts.
- The instructor was very helpful by taking life experiences and relating it to the course material. The instructor also asked for our experiences and made the course much more relatable.
- I thought the written responses we had to do were interesting and engaging. I also appreciate that the instructor was more interested in teaching information we need for everyday life rather than obscure facts from the book.

Caring Leadership

A common thread in the SPOT survey responses was caring leadership, which encompassed the following categories: (a) fostering mutual respect; (b) valuing students’ opinions; and (c) connecting the course material to students on a personal level. Selected examples of students’ comments associated with caring leadership are as follows:

- The instructor genuinely cares about how the material is going to be useful in the students’ everyday life and future.
- The instructor is passionate about the subject and clearly wants to see students succeed. The instructor presented class material clearly and made the course challenging enough to truly help students learn and understand the material.
- The instructor is an amazing, knowledgeable professor. It’s so refreshing to have a professor that actually cares about their students!!
- The instructor obviously cares about students. The instructor really wanted to make sure that students understood the material and got the chance to under-
stand the material. Class was always different and it made class always interesting because we knew that it would be a great class. The instructor has such an upbeat personality and you could tell that the instructor loved being there and seeing students.

- The instructor cares about students and that shows in the instructor’s quick responses in e-mails and the instructor’s attitude in class towards students.

Making the Class Feel Smaller

The instructor-researchers identified a third salient theme: making the class feel smaller. The responses indicated the following categories: (a) knowing students’ names; (b) utilizing general information about students as it applies to course material; and (c) encouraging student participation. Selected examples of student’s comments for the theme of making the class feel smaller are as follows:

- The instructor did a great job. I feel that everything I have learned will help me in the future and is all useful information. The instructor did their best to interact with the student in a large lecture and make a one-on-one connection.
- I really liked the instructor as a teacher. The instructor never made the class boring. I like how the instructor got to know each individual and their names even though there were over a hundred students in the class.
- I liked how the instructor really tried to engage the students in conversation and get their input.
- The instructor was personable, remembered names, told stories, open for feedback from the class.
- The instructor was very nice and clearly made an effort to learn students’ names even though there were a lot of them, which I can appreciate.

BPSIILC Online Survey

The instructor-researchers purposefully crafted the BPSIILC online survey to target the feedback received from the SPOT survey. Since the questions derived from the identified themes and categories of the SPOT survey data, the findings are presented accordingly. The instructor-researchers coded the responses from the BPSIILC online survey in the same manner as the responses from the SPOT survey. Student responses to the BPSIILC online survey’s open ended questions were independently coded by each instructor-researcher through several iterations of reading the responses and maintaining a list of unique words or phrases students used to describe their experiences in each of these two large consumer studies courses. Each instructor-researcher compiled their own findings and compared the same during a second session.

The BPSIILC online survey captured the following demographic information: gender and classification at the beginning of the spring 2015 semester. Sixty undergraduate students completed the online survey; however, demographic data were only provided by 58 students. Eleven (18.9 %) of the 58 participants were male and 47 (81.03%) were female, which was consistent with the enrollment in both classes. These undergraduate students
were mostly juniors (46.6%) followed by sophomores (37.9%), freshman (8.6%) and the smallest group were seniors (6.9%), which was parallel with the enrollment of both classes.

It was important for the instructor-researchers to know how many large classes each student participants had experienced. This provided the instructor-researchers insight to the exposure to large classes by the participants. Thus, the first question in the survey was “How many classes with over 50 students have you been enrolled in, including this class?” Of the 60 participants, over 50% had been enrolled in eight or more large classes (see Table 1).

Table 1. Question 1: “How many classes with over 50 students have you been enrolled in, including this class?”

<table>
<thead>
<tr>
<th>Response</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>10 or more</td>
<td>22</td>
</tr>
</tbody>
</table>

The second question posed was “Did your instructor do the following activity in your class: used student’s personal information from activities; used storytelling/personal experiences; made an effort to learn students’ names; provided timely feedback and comments on graded assessments and activities; encouraged students to actively participate in class; treated students with respect and as individuals; consistently took attendance; was passionate about teaching the content.” Of the 60 participants, 59 (98.3%) answered that the instructor treated students with respect and as individuals and 42 (70.0%) answered that the instructor consistently took attendance (see Table 2).

The third question in the survey was “How effective was the following activity in creating positive student-instructor interactions in this large class: used student’s personal information from activities; used storytelling/personal experiences; made an effort to learn students’ names; provided timely feedback and comments on graded assessments and activities; encouraged students to actively participate in class; treated students with respect and as individuals; consistently took attendance; was passionate about teaching the content.”

For the present study, the mean for each activity was computed for the participants’ responses. The scale ranged from very ineffective (1) to very effective (5). A brief report of
Table 2. Question 2: “Did your instructor do the following activity in your class?”

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>treated students with respect and as individuals</td>
<td>59</td>
<td>1</td>
<td>98.3</td>
</tr>
<tr>
<td>used storytelling/personal experiences</td>
<td>58</td>
<td>2</td>
<td>96.7</td>
</tr>
<tr>
<td>was passionate about teaching the content</td>
<td>58</td>
<td>2</td>
<td>96.7</td>
</tr>
<tr>
<td>made an effort to learn students’ names</td>
<td>55</td>
<td>5</td>
<td>91.7</td>
</tr>
<tr>
<td>encouraged students to actively participate in class</td>
<td>53</td>
<td>7</td>
<td>88.3</td>
</tr>
<tr>
<td>provided timely feedback and comments on graded assessments and activities</td>
<td>53</td>
<td>7</td>
<td>88.3</td>
</tr>
<tr>
<td>used student’s personal information from activities</td>
<td>45</td>
<td>15</td>
<td>75</td>
</tr>
<tr>
<td>consistently took attendance</td>
<td>42</td>
<td>18</td>
<td>70</td>
</tr>
</tbody>
</table>

The mean and standard deviation of each activity is shown in Table 3. The highest mean for effectiveness in creating positive student-instructor interactions was “treated students with respect and as individuals” (4.77). The lowest mean was for “used student’s personal information from activities” (4.08).

Table 3. Question 3: “How effective was the following activity in creating positive student-instructor interactions in this large class? (N = 60)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>treated students with respect and as individuals</td>
<td>4.77</td>
<td>.46</td>
</tr>
<tr>
<td>was passionate about teaching the content</td>
<td>4.73</td>
<td>.45</td>
</tr>
<tr>
<td>used storytelling/personal experiences</td>
<td>4.62</td>
<td>.58</td>
</tr>
<tr>
<td>made an effort to learn students’ names</td>
<td>4.57</td>
<td>.83</td>
</tr>
<tr>
<td>provided timely feedback and comments on graded assessments and activities</td>
<td>4.57</td>
<td>.77</td>
</tr>
<tr>
<td>encouraged students to actively participate in class</td>
<td>4.45</td>
<td>.79</td>
</tr>
<tr>
<td>consistently took attendance</td>
<td>4.22</td>
<td>.94</td>
</tr>
<tr>
<td>used student’s personal information from activities</td>
<td>4.08</td>
<td>.89</td>
</tr>
</tbody>
</table>

Note: The scale ranged from very ineffective (1) to very effective (5)
The fourth question was “What additional comments do you have pertaining to strategies and/or activities that the instructor used in order to create positive student-instructor interactions in this large class?” The results relating to the identified theme of self-disclosure captured the following categories: (a) storytelling to relate to course material; (b) disclosing instructor’s personal stories; and (c) sharing peer stories. Selected examples of student’s comments supporting this theme are as follows:

- The instructor would ask us about our life experiences so we would engage and participate more in the content.
- Sharing personal stories that related to the course material and allowing us to share our own stories helped to obtain a better understanding of the material.
- Encouraging students to share their own experiences and stories about the material.
- I think the instructor did a great job of keeping the students engaged with their personal stories.
- I think that two strategies were very effective in the large class and those two were the instructor trying their best to know students' names and telling stories during lecture. When the instructor demonstrated that they knew your name, the instructor became even more approachable to the students. And I think telling stories not only helped students understand course concepts better, but also made the instructor more engaging and relatable to the students.

A common thread in the BPSIILC online survey responses was caring leadership which encompassed the following categories: (a) fostering mutual respect; (b) valuing students’ opinions; and (c) connecting the course material to students on a personal level. Selected examples of student’s comments associated with caring leadership are as follows:

- I always find that a professor knowing my name helps me feel welcome and cared for!
- The instructor often asked about people's own experiences dealing with the content of the material, which applied it to real life.
- The instructor made the content very relatable. The instructor asked when the instructor could share information with the class about a classmate that could help the others.
- The instructor would actively engage with students during class, and have conversation rather than just typical student teacher transaction.
- The way the course is planned out and taught is hands down the best way to teach a class of that size. When I walked into the classroom, I felt like I was known by people instead of just sneaking into my seat each day.
- I really enjoyed the class because of the teacher mainly. The instructor really knew the information and was very dedicated to teaching it. The instructor knew me by name and graded things quickly, responded to e-mails quickly, and gave enough resources to do good on the tests and assignments.

The instructor-researchers’ identified third salient theme of making the class feel smaller indicated the following categories: (a) knowing students’ names; (b) utilizing general information about students as it applies to course material; and (c) encouraging student par-
ticipation. Selected examples of student’s comments for the theme of making the class feel smaller are as follows:

- I think learning students’ name was a great strategy because it makes the class seem smaller.
- I believe that all instructors teaching relatively large classes should try to learn all of the students’ names to show the students that they are in-fact, more than a number.
- I like that the instructor knew my name. It definitely made the class feel smaller and like the instructor cared for us and wanted us to achieve success. I also like the instructor’s passion to teach the class. It made the class much more enjoyable and relatable.
- The instructor would talk to the class like they were talking to the students individually. The instructor would engage the whole class in activities and lecture.
- Although the class was quite large, I felt a personal connection with the instructor because the instructor always greeted me by name.
- The instructor knew everyone’s name in class. This made a large class feel very small. The instructor obviously cared more than just the grades. In turn that made me more interested in the class.
- The instructor made a large class feel small by learning our names and encouraging us to participate.
- I was very impressed with the instructor’s effort to learn the names of students even when they didn't constantly interact.

The fifth question was “What additional strategies and/or activities do you feel instructors could use in order to create positive student-instructor interactions in large classes?” Suggestions provided by the students are as follows:

- I think the differences I have seen in the classes is that some teachers aren’t personable. If that is the case, why would anyone want to listen to some one speak about a topic that they aren’t passionate about? Professors should be able to relate to the content they are teaching; that way, even if it is a large class, one is more apt to listening.
- Anytime you offer the class options it makes the class feel “powerful.” It could be as simple as when to turn in a homework assignment (Monday vs. Friday).
- The main thing is making the students feel like they aren’t in a large class. They want to feel like they can have the one-on-one interaction with the professor.
- Maybe having the large class split up and meet in a smaller group.
- I think maybe making it clear to students that an instructor is available during office hours and wants students to show up to office hours and ask questions/get clarification on course topics is important. It really helped students and is noticed by the students when instructors take time during office hours to help address students’ issues.
Discussion of the Findings

The instructor-researchers of this study identified three strategies to promote positive student-instructor interactions in large classes at a research institution. Students participating in this study emphasized the following strategies in their responses to the SPOT survey: self-disclosure, caring leadership, and making the class feel smaller. The second survey, BPSIILC online survey, requested greater detail about each specific strategy and their effectiveness in promoting positive student-instructor interactions.

Self-Disclosure

Students reported an increase in motivation to learn and attend class when the instructor shared personal experiences and stories related to the course material. Students also expressed a greater sense of knowledge and understanding when course material was related to real world experiences. Thusly, linking current events, personal stories, and storytelling is an effective way to build positive student-instructor interactions provided that the instructor remains on topic.

Caring Leadership

When it came to caring leadership, having an instructor genuinely care about how the course material would affect their life and their future resonated with students. In the BPSIILC online survey, students reported an instructor’s passion is effective in building positive student instructor interactions. Students are more likely to be engaged and learn when an instructor’s passion is evident during course lectures. As Wilson (2013) put it, “caring leadership reinforces life-long learning skills, develops positive habits, and enhances self-efficacy” (p. 26).

Making the Class Feel Smaller

An effective engaging instructor has the ability to make a large class feel smaller. Addressing students’ by name when asking or answering questions is an effective way to motivate and encourage student engagement. Asking and encouraging questions is one technique an instructor can use during an interactive lecture. Questions can be used to initiate and stimulate instructor-student and peer-to-peer interactions. As for students, they are expected to actively participate, answer faculty questions, participate in collaborative in-class activities, and share stories or experiences related to course topics. When students have a clear outline and understanding of course expectations they are more likely to participate in class and have a positive attitude about the course.

Implications

The findings from this study highlight the importance and benefits of positive student-instructor interactions in large classes. The proven value of positive interactions suggests that instructors must strive to add to their subject-matter expertise and curriculum a layer of connectedness with students. For instructors, the effectiveness of such interactions will
depend upon using multiple strategies and using them consistently while working around the challenges associated with student-instructor exchanges in large classrooms.

**Challenges and Solutions for Self-Disclosure**

Storytelling offers instructors an opportunity to supplement a traditional lecture by immersing the class in an intellectually in-depth, applicable illustration relevant to the subject matter. In large classes, a natural challenge to engage students exists, partly due to the amount of students. However, appropriate and concise storytelling can lead to a connection with students (Lowenthal, 2008). One hurdle instructors face is the potential to veer off-topic and thus disengage students. To resolve this, instructors need to consistently articulate stories and personal experiences that are both relevant to the subject matter and relate to students’ current and future situations. Encouraging students prior to class to be prepared to share personal experiences related to the subject matter is another solution that builds connectedness.

**Challenges and Solutions for Caring Leadership**

In large classes, some students are not comfortable raising their hands to ask or answer questions, share stories, or be called upon. Thus, instructors should lead interactive activities or discussions that may ease students into making contributions to the class, even when the students initially feel timid or intimidated.

One way that instructors can exemplify caring leadership is to use the names of students who ask or answer questions. If a student answers a question and the instructor does not know his or her name, the instructor can say, "Thank you for answering the question. Please tell me your name." Then the instructor can incorporate the student’s name when addressing the question or transitioning into other course material: "As Luke mentioned...." In large classes, such engagement can promote learning. Williams, Childers, and Kemp (2013) reported that a stimulating and encouraging classroom enhances student participation, attendance, and comprehension of course content.

Another effective and realistic way for instructors to exemplify caring leadership is to convey the benefits of learning the course material and completing assignments. Although students know that they will be graded against course requirements, they can be motivated beyond the simple completion of assignments. When instructors outline the practical and applicable benefits of the course, students are more likely to be connected to the material. For instance, the authors have had success sharing former students’ stories with current students: “My former students have expressed that this particular assignment assisted them in the real world when....” Conveying these additional benefits is a proven way to connect with individual students in large classes. As supported by Paolini (2015), the more instructors encourage and motivate students to succeed, the more likely students will be connected to the material.
Challenges and Solutions for Making the Classroom Feel Smaller

When employing strategies to make a large class feel smaller, a caring and genuine instructor will convey to students messages of inclusion, appreciation, and a willingness to communicate, thus enhancing student engagement (Mottet et al., 2004). As a result, students are engaged and they learn more. Consider a comment from one student in the study who completed the SPOT survey: “I really appreciated how well the instructor could command the classroom. The instructor had an ability to engage the students in the material in a way that was interesting and fun. I noticed that more students were actively engaged in the class and material versus other classes that I have been in.”

In large classes, instructors may have a tendency to spend too much time prior to or during class trying to learn students’ names and remembering information about them. Given these time constraints, one remedy is to briefly interact with students before class. For example, an instructor can approach a student before class begins, confirm the student’s name, and ask a question about the material as simple as, “What did you learn from the reading material or the last class?” The instructor will then have an anecdote to share during the lecture such as: “Earlier, Samantha mentioned that she enjoyed learning about….” Such interchanges engage students and encourage participation, at the same time establishing connections with others in the large classroom. Additionally, the instructor’s initiative to engage one student immediately sends several direct and indirect messages to the entire class: that the instructor cares enough to interact with each individual; that the instructor knows the students’ names and will refer to them by name; and that each student should be prepared to answer questions and participate in class discussion. From the BPSIILC online survey, one student noted that having personal conversations with each student is a strategy that instructors could use to promote positive student-instructor interactions in large classes. Therefore, we can see that instructors should be diligent to engage with individual students as often as class schedules and availability will permit.

Benefits for Faculty

As much as students gain from the personal attention and positive interactions with instructors, the instructor will also realize benefits: (a) students are attentive and engaged in class; (b) students are more comfortable talking to them; (c) the course is more interactive and engaging; and (d) the positive student feedback offers the instructor further opportunities for professional development. This study’s instructor-researchers unequivocally agree that seeking positive interactions with students is the foundation for successful teaching, especially in classes with up to 150 students.

Limitations

There are limitations of this study that should be acknowledged. First, the student participants came from a large public university. It is unknown how these perceptions might compare to students at other institutions. Second, the e-mail solicitation of survey participants typically leads to low response rates and could have been easily dismissed by students in the summer time. Despite the limitations, the findings reported here corroborate
what the instructor-researchers believe to be three effective strategies and techniques to build positive student-instructor interactions in a large class.

Conclusion

It is often perceived that students in large classes are not highly motivated, satisfied, or engaged. To respond to this, the authors posit that building positive student-instructor interactions can promote student engagement in large classes. In a context where large classes are more frequent, it is important to consider strategies that will achieve the same outcomes desired in small classes. To accomplish this, careful consideration should be given to how instructors interact with students.

This study contributes to the literature by incorporating results from two online surveys to identify effective strategies to build positive student-instructor interactions: self-disclosure, caring leadership, and making the class feel smaller. This study is important because it provides a better understanding of the significance of positive student-instructor interactions in large classes from the student’s perspective. The findings underscore the important role that instructors play in facing the challenges of large class settings.

References

Strategies for Building Positive Student-Instructor Interactions in Large Classes


The Perceived Effects of Flipped Teaching on Knowledge Acquisition

Galen Newman\textsuperscript{1a}, Jun-Hyun Kim\textsuperscript{a}, Ryun Jung Lee\textsuperscript{a}, Brandy A. Brown\textsuperscript{b}, and Sharon Huston\textsuperscript{a}

\textsuperscript{a}Texas A\&M University, College Station, TX, 77843
\textsuperscript{b}University of Arizona, Tucson, AZ 85757

Abstract

Increased demands for technological integration in higher education have resulted in new forms of course instruction. Under a flipped approach, students learn course materials outside the classroom while active learning methods are employed inside. This study focuses on the perceived effects of flipped instruction on knowledge acquisition in undergraduate students using information communication, accessibility, stimulation, interaction, and accumulation as measures. Undergraduate students indicated positive effects of flipped teaching and student’s perceived learning improved as time spent using learning management systems increased. While knowledge acquisition tended to increase in most students, technological incompatibilities prevented the flipped approach from being fully accepted.

Keywords: Flipped teaching; higher education; technological pedagogy; blackboard; online instruction.

Increased usage of flipped teaching has inverted not only the classroom, but the entire teaching paradigm. Current pressures for increased enrollment in higher education programs combined with advances in technology have facilitated flipped and blended/hybrid models of teaching to increase active learning (Hobbs, 2013). The difference between the two approaches is that while blended/hybrid teaching seeks to create student learning experiences that flow back and forth between face-to-face and online (or at least technologically supported) situations, flipped teaching exposes students to course material prior to class time (with or without the use of technology), allowing for increased interaction and engagement with the instructor during course time (Ellis Steed, & Applebee, 2006). While the traditional lecture style of teaching remains the norm worldwide (Thomasian, 2011), flipped teaching methods have been widely applied to aid instructors struggling to teach newly developed large classes which cover vast amounts of material in a limited time and cater to a multitude of majors.

While momentum for the approach has gained traction, there is also a debate as to the success of its application. Little research has been conducted on the subject to help settle these debates, specifically research which analyzes the perceived effects that flipped teaching can have on learning (Moravec, Williams, Aguilar-Roca, & O'Dowd, 2010). In

\textsuperscript{1} Corresponding author's email: gnewman@arch.tamu.edu

\textit{The Journal of Effective Teaching, Vol. 16, No.1, 2016, 52-71}

©2016 All rights reserved.
this study, a course covering the History of Landscape Architecture was utilized to assess the perceived effects of flipped teaching on knowledge acquisition. It is assumed that if a student perceives that they are learning more and are benefiting from a certain type of course format, they are likely to have higher levels of engagement and perceive greater value from the course, and that this may lead to better performance and increased rates of persistence and completion. Six of the fifteen week course operationalized flipped instructional delivery. Results from a survey of 183 students in the course were then utilized to analyze the overall perceived effectiveness using five measures – information communication, information accessibility, information stimulation, information interaction, and information accumulation.

**Background and Literature Review**

**Defining flipped teaching**

The term, ‘flipped teaching’ (or ‘inverted teaching’ came from the idea of inverting the conventional way instructors impart information (Lasry, Dugdale, & Charles, 2014). The general concept of the model is to move the basic knowledge out of the classroom and then use class time for activities that deepen that knowledge (Love, Hodge, Grandgenett, & Swift, 2014). This model has been used for over two decades in the humanities and has recently become popular in other disciplines, largely due to its promotion in the book *Effective Grading* (Walvoord & Anderson, 2011). Since its inception, the flipped learning model has been used by higher education instructors to reduce the need to communicate easily digestible information and allow both students and faculty to do more active learning, often with the assistance of technology (Hamdan, McKnight, McKnight, & Arfstrom, 2013).

Most research on flipped instruction seeks primarily to define the flipped method rather than explore its effects or perceived effects in the classroom. Lage, Platt, and Treglia (2000) defined it simply as a series of events that have traditionally taken place inside the classroom which now take place outside the classroom, and vice versa. Hamdan et al. (2013) extended this definition by defining it as a way of teaching a group of students with readily available material that can be accessed by students whenever and wherever they want; but concluded that inverted instruction intensifies in-class teaching only when it remains student-centered and based on the needs and abilities of those interacting with the course materials. Bishop and Verleger (2013) identified flipped teaching as an educational technique consisting of two parts: interactive group learning activities inside the classroom, and direct computer-based individual instruction outside the classroom. This study operationalizes this definition as flipped materials in the course utilized for the study were covered by computer based instruction outside of the classroom utilizing interactive learning modules, cinematic screening, YouTube videos, and access to reading materials, while in class instruction sought to deepen knowledge through module feedback, pre-submitted questions and interactive discussions on materials/questions covered.
The basis for flipped teaching

As far back as 1981, video based lectures in higher education were suggested to help or, in some cases even out-perform in-person lectures (Cohen, Ebeling & Kulik, 1981), yet their adoption in higher education has been sluggish until recently. The implementation of interactive media into lecture based videos has also been shown to help amplify this condition, especially in online platforms (McNeil & Nelson, 1991; Zhang, Zhou, Briggs, & Nunamaker, 2006; Passey, 2011). Nearly 10 years later, researchers such as Eric Mazur (1991) began emphasizing the integration of computers and other technologies into the teaching process. Mazur claimed that, eventually, computers could be tough to help teach and would become an integral and dynamic tool for improving the quality of education.

As Mazur (1991) predicted, the computer has become mandatory in both academia and business. It was not until recently that flipped learning was popularized due primarily to the development of various typologies of online learning and new interactive technological advancements. Khan’s (2012) speech at TED Talks amplified this popularity, describing how video could serve as a rapid, widespread means of disseminating information. The speech helped initialize efforts for flipped teaching, suggesting that online material should be efficiently and successfully utilized in mainstream course delivery. In combination with the shift in public opinion, adoption of the model has also been propelled by large scale technological advances, the availability of free or cheaper software, and mounting pressures from increasing tuition costs and free, online course offerings (e.g. massive open online courses, or MOOCs); the combination of these events opened discussions on and catalyzed change in the physical classroom (Bishop & Verleger, 2013).

The flipped model is being adopted rapidly into higher education due, in part, to changes in societal perceptions, the needs and pressures in academic institutions, growths in educational technology options, and a growing emphasis on student engagement. Widespread adoption of the flipped instructional model has been limited for several reasons, including the limited research undertaken to assess the perceptions on student learning that can result from the flipped classroom environment (Love et al., 2014). Miller (2012) indicated that flipped teaching is not a perfect solution to education, but does offer benefits to increasing student engagement. Tucker (2012) expanded this point and posited that more specified strategies were needed to increase student attentiveness and motivation. To achieve this, new interactive tools and multimedia should be incorporated into this novel style of teaching (Sheehy & Bucknall, 2008).

If executed correctly, flipped teaching has shown to be a fairly effective method to organize and disseminate online material to aid in instructional delivery in higher education. The flipped method can help increase the efficacy of in-class learning by affording students the ability to obtain information outside of class. By alleviating the need to force a set of materials into a singular time frame, flipped teaching provides instructors the ability to spend more time with students needing increased assistance while allowing well-performing students more free time (Tucker, 2012). Because flipped courses use mostly online material, in theory, this method can help increase the instructors teaching efficient-
ly leading to higher research and service opportunities. While opportunities to listen to and engage with students increase (Stone, 2012), instructors are also allowed to focus more on their area of expertise (Lasry et al., 2014).

In regards to meeting learning outcomes, the rationale for the flipped model has been supported through the long-standing theoretical basis for (1) effectiveness of active learning (Bransford, Brown, & Cocking, 2000; Grant, 2014), (2) positive effects of improved student-teacher interaction (Toto & Nyugen, 2009), (3) positive effects of real-time feedback (Moravec et al., 2010) and (4) increased student engagement through self-paced learning and more meaningful coursework (Goodwin & Miller, 2013). Much of this research is only indirectly linked and has been conducted mostly in K-12 classrooms, but has shown to have strong correlations with positive learning effects (Goodwin & Miller, 2013). A few isolated articles have reported significant learning gains using this model (Brame, 2014), but there is a general lack of specific evidence on student perceptions of the effects of the flipped approach (Bishop & Verleger, 2013; Herreid & Schiller, 2013).

**Perceptions of flipped learning**

The growing number of instructors and researchers have presented only a small body of work investigating the effectiveness of flipped teaching. Studies in higher education examining perception seem to be relatively consistent in their conclusions that overall opinions on the approach tends to be positive with relatively small ratios of students strongly disliking the method (Bishop & Verleger, 2013). Students tend to watch most assigned lecture videos and came to class better prepared than those asked to complete typical pre-class textbook reading assignments (deGrazia, Falconer, Nicodemus, & Medlin, 2012). Other studies reinforce this notion, suggesting that many higher education students do not typically complete assigned readings (Sappington, Kinsey & Munsayac, 2002). Requiring pre-class quizzes or some form of formative questioning on the materials covered was also shown as a common method for increasing learning in most flipped approaches.

Student perceptions of flipped learning can sometimes be a bit conflicting. Students, just like anyone else, can sometimes be resistant to change, regardless of improved outcomes which can result in lower perceptions for newer teaching models (Martin, 2012). One study found, while there was a preference for in-person lectures over video lectures, there was also a contradicting preference for the class interaction afforded by flipping the course (Toto & Nyugen, 2009). This paradox has been found to be somewhat alleviated if shorter or more organized, less-lengthy videos are utilized as out of class materials (Zappe, Leicht, Messner, Litzinger, & Lee, 2009). The use of video lectures coupled with worksheets or some form of formative/summative technique was also shown by Moravec et al., (2010) to increase overall performance in the class by up to 21%. This technique has also been shown to increase scores on individual homework assignments, projects and tests (Day & Foley, 2006).

Despite these benefits, flipped teaching can also present some drawbacks. The first, and primary, issue is the ability to access course information. Technical glitches may deter students from concentrating on learning materials and/or working on assignments (Saban,
2013). Also, equity can be a concern. Underserved persons without internet access may have limited or no capability to access materials away from campus (Driscoll, 2012). Thirdly, stimulation of students outside of class using online materials can be difficult. Although online materials have been shown to increase enthusiasm in some cases (because they are different than some traditional drab lecture techniques), students can have difficulty being self-motivated from studying alone at home without the professor present and can become easily dissatisfied (Tune, Sturek, & Basile, 2013). The utility of different types of online materials can help students feel more dynamic when undertaking their assignments but this requires that professors and students become familiar with new software (Mayer, 2003). Some case study results support the idea that flipped materials assist students in controlling their own pace when studying (McLaughlin et al., 2014) but overall results tend to vary depending on class size (Stone, 2012).

Much research on flipped teaching has shown that an approach incorporating a multitude of instructional delivery types allows the flipped model to cater to several learning styles while increasing interaction (Fredericks et al., 2013). Google sites such as survey tools have also been used to create interactive lectures with relative ease in regards to both instructors use-ability and student operationalization (Saban, 2013). Lasry et al.’s (2014) approach, known as “Just in Time Teaching (Flip-JiTT)”, shows great promise as a flipped framework and includes assigned textbook readings coupled with computer simulations and online video tutorials as a means of reinforcing lecture material through repetition. Bergmann and Sams (2008) made video casts, or vodcasts, of their lectures and saw a letter grade improvement in many of their high school students. Further, when comparing scores with state exams the average scores of students being taught with the flipped method in high school were nearly identical, meaning that the flipped approach produces at least comparable test scores as the traditional method. Other courses have used features such as web-based modules containing lecture materials, videos, and formative questioning as a means of increasing interactivity through flipped instructional delivery.

**Flipped teaching and knowledge acquisition**

The goal of any course (flipped or non-flipped) is to improve teaching and learning environments while delivering the instructors’ knowledge efficiently to students. This can be accomplished through a variety of student-centered, active learning strategies. The basic premise behind instructional inversion is that students formulate or acquire knowledge through participation with course material while learning self-motivational skills through the opportunity of self-paced learning and information review (Hamdan et al., 2013). Although the effectiveness of the flipped method has been debated, studies using flipped classrooms have shown significant increases in performance based on summative assessment compared to standard lecture-based courses (Bishop & Verleger, 2013; Herreid & Schiller, 2013). These results have typically been based only on comparisons between scores in summative assessment techniques such as quizzes or exams, making it difficult to determine what specifically causes increases in performance (Tune et al., 2013).
Even in research studies showing no significant grade differences between traditional-lecture-based and flipped courses, students still perceived they had acquired more knowledge through the inverted class style of teaching (Findlay-Thompson & Mombourquette, 2014). In flipped courses, students learn lecture materials outside the class and are able to relearn difficult materials in-class, which makes the knowledge delivery process perceptively more complex. Simultaneously, students are influenced by various factors that contribute to better understanding of the curriculum. For instance, the increased interaction with instructors may lead students to a better comprehension of class materials or the increased convenience of access to course materials may increase student motivation. For these reasons, the positive effects of flipped teaching cannot be determined by only examining summative assessment scores. Research must also begin to evaluate the specific effects of flipped instruction on the acquisition of knowledge in order to glean more thorough understanding of its influence. Perhaps the first step in addressing this issue, is to better understand the perceived effects of flipped teaching by students.

**Methodology**

**Research objectives**

This study focuses on assessing the perceived effects of flipped instruction on knowledge acquisition. The objective is to determine if the flipped model can be used as a successful approach for pedagogical delivery in undergraduate teaching based on student perception and performance. Marzano, Pickering, & McTighe (1993) identify information communication, information accessibility, information stimulation, information interaction, and information accumulation as important facets to knowledge acquisition, a key dimension of their five dimensions of learning. On this basis, our study utilizes these facets as measures to assess the perceived effects of flipped teaching on knowledge acquisition (see Figure 1).

Information communication examines inter-student and student-professor contact and exchange of ideas. The out of class features of flipped teaching are highly debated due to the various material used for classes and students’ two-sided attitudes on out-class lectures. The quality and ability to access the out of class materials (mostly online materials) is assessed according to the information’s accessibility. If the information is highly accessible, the information interaction (as well as the in-class communication) should also increase. As communication, accessibility, and interaction increase, information stimulation is assumed to intensify. Since flipped teaching focuses on the interaction between students and the professor in the classroom in an effort to lead to better perceived information communication, utilizing the flipped model should lead to higher perceived information accumulation, or increases in knowledge, by students. It is assumed that if each variable is positively impacted, then overall perceived effects on knowledge acquisition, or long term procurement of information, will increase.
Figure 1. Conceptual Model of Measures Utilized to assess the effects of Flipped Teaching on Knowledge Acquisition.

Course context

Recent pedagogical research in undergraduate design teaching has concentrated primarily on approaches to studio based instruction, examining elements such as service learning (Doble & King, 2011), interdisciplinarity (Kondolf, Mozingo, Kullmann, McBride, & Anderson, 2013) and participatory based approaches (Hester, 2012). Simultaneously, the paradigm shift from an emphasis in STEM (Science, Technology, Engineering, and Mathematics) based education to STEAM (Science, Technology, Engineering, Arts and Mathematics) education has placed importance on creativity alongside math and science in higher education (Park & Ko, 2012; Kim & Park, 2012). A course with 183 students enrolled covering the History of Landscape Architecture was utilized to carry out this study. The course is a general introduction to the history of human settlement and landscape design/planning, from prehistory to the nineteenth century, primarily outside of North America. Global examples of renowned landscapes are introduced in class and discussed in reference to their historical development and discussed in regards to their particular cultural and philosophical contexts. The methods employed through course inversion were exercises involving mixed-media and interactive online learning modules with built-in formative questioning.

Six of the fifteen week course operationalized flipped instructional delivery. During flipped sections, students were assigned to (1) individually complete online lecture modules, (2) answer the embedded questions about the materials covered and (3) prepare two discussion questions prior to each class for in-class dialogue, clarification, and to facilitate interaction for formative assessment purposes. Of the twelve topics covered in the course, every two topics were summative in-class quizzes were distributed (six total) and
every three topics summative online tests were distributed (four total). The lecture modules were developed as interactive instructional delivery vehicles with formative assessment questions built into them to be completed outside of class. A point value for correct answers were given and grades calculated based on performance for each module. A survey was conducted at the end of the semester in an attempt to gauge the perceived effectiveness of the flipped teaching method.

All interactive modules were developed as SCORM (Shared Content Object Repository Model) learning objects. SCORM objects record the history of a student's interactions with the object, and are capable of automatically grading objective questions (such as multiple choice, drag and drop or true-false) and report resulting grades to learning management systems (LMS). The multimedia designers used Articulate Storyline to develop the modules, each which contained downloadable key terms, audio, images, video, assessment questions, and closed captioning. The university the course was taught at recently adopted Blackboard as its LMS, so all modules were uploaded to a Blackboard classroom and all grades were stored in the Blackboard Grade Center through the eCampus platform. The eCampus platform is an online learning management system for storing and organizing course materials. It houses Blackboard and other software all in one arena and allows for student interaction with course materials. Other analytic data, including student responses for formative module questions and the number of times students accessed the modules, were also recorded in eCampus. A combination of lecture modules, PDFs of the lectures, online cinematic screenings, YouTube videos, and one-chapter readings per lecture module were all assembled as accessible information through eCampus. Student performance in class was analyzed through the combination of tests, quizzes, discussion forum/question postings and module scores. Quizzes were taken in class using iClickers to compare students’ performance on topics covered while four summative tests were taken out of class online at designated times.

Surveyance and analysis

The survey had a 100% response rate and consisted of 28 questions. Self-selection bias was examined in the survey through asking students if they had known about eCampus use in the course before it began. Over 84.2% were not aware of the high utility of eCampus when they registered for the class. Of the 183 students registered in the course, there were close proportions of each gender (female: 41.0%, male: 59.0%). Students were evenly distributed in terms of their background with the course harboring 32 different majors (see Table 1). Over 60% of the students had not used eCampus prior to the course (due to the University's recent adoption of the media), with 45.9% of students responding they had previous experience with online courses.

Each survey was taken individually, using Qualtrics online survey software. Students were assured their responses were recorded anonymously. Among the responses, 81.4% of students answered they had used the modules according to the specific instructions provided prior to class by the instructor, increasing the reliability of results.
The survey instrument was categorized to gather information on students’ (1) background, (2) perceived learning experience in the course, (3) preferences for course materials and assessment tools utilized in the course, and (4) overall experiences with the flipped method. The sections on learning experience and preferences for course materials and assessment tools utilized in the course were set up on a Likert scale (1-5) and the overall means for each question were calculated. A higher score indicated the tool or materials were more helpful to learning while a lower score indicated the inverse. Descriptive statistics, one way Analysis of Variance (ANOVA) and Spearman bivariate correlation analyses were conducted to evaluate the survey feedback. Bivariate correlation was used to gauge general relationships between individual variables and ANOVA was conducted to help determine specific relationships revealed by the bivariate analysis. These statistics sought to measure if student level (e.g. freshman, sophomore, etc…), time spent on eCampus or major effected changes in grades. The time each student spent on eCampus was extracted from the Blackboard database, which collected information on time logged in and log-in amounts.

**Results**

**Overall preferences**

The majority of students enrolled in this course reported positive attitudes in regards to the effectiveness of flipped teaching. In fact, over 80% of students’ preferred online assessment over in-class assessment and students’ past experience with taking online courses was significant for their expected grade at the 0.1 level (see Table 1). This suggests that most students who had taken online based courses before, expected higher grades at the beginning of the semester than they ended up receiving.

Initially, ANOVA was used to statistically measure the difference among year levels in regards to grade change and no significant difference was found. ANOVA results on students’ grades by major provided showed that the means were not all same at a .05 significance level, but failed to detect a significant difference in the post-hoc comparison (see Table 2). The post-hoc test on the ANOVA showed that the differences between student grade groups divided in to A and C, and between group B and C were significantly different ($p < .05$), while the differences of other groups were not. This indicates that students receiving a grade of A or B spent more time on eCampus than the students who received a C, showing a positive influence of time spent on eCampus on students’ final grades (see Table 3).

**Information communication**

Flipping lecture sessions did not appear to have much perceived influence on increasing communication between students (see Table 4). Among students surveyed, 59 students (33.2%) disagreed and 48 students (26.3%) agreed there were greater opportunities to communicate with other students using the flipped model. The ability to increase student-professor interaction seemed to increase using the flipped model while inter-student interaction showed little to no increase. Survey results confirm over two-thirds (69%) of the
Table 1. Description of Survey Participants.

| Table 1. Description of Survey Participants. |
|-----------------|---------|-----------------|-----------------|
| Participants    | Unit    | Size            | Freq. (%)       |
| Gender          |         |                 |                 |
| Female          | 183     | 75 (41.0%)      |                 |
| Male            | 108     | 59.0%           |                 |
| Level           |         |                 |                 |
| Freshman        | 183     | 52 (28.4%)      |                 |
| Sophomore       |         | 49 (26.8%)      |                 |
| Junior          |         | 48 (26.2%)      |                 |
| Senior and above (5th year) | 34 | 18.6% | |
| Major           |         |                 |                 |
| University Studies in Architecture | 183 | 89 (47.1%) | |
| Landscape Architecture |         | 30 (15.9%) | |
| Construction Science |         | 18 (9.5%) | |
| Environmental Design - Architectural Studies | 11 | 5.8% | |
| Urban and Regional Planning | 4 | 2.1% | |
| Other a         | 31      | 19.6%           |                 |
| Blackboard Acknowledgement Prior to the Course |         |                 |                 |
| Yes             | 183     | 75 (41.0%)      |                 |
| No              | 108     | 59.0%           |                 |
| Blackboard Experience |         |                 |                 |
| Yes             | 183     | 58 (31.7%)      |                 |
| No              | 125     | 68.3%           |                 |
| Blackboard Usage Acknowledgement in Class |         |                 |                 |
| Yes             | 183     | 29 (15.8%)      |                 |
| No              | 155     | 84.2%           |                 |
| Other Online Course Experience |         |                 |                 |
| Yes             | 183     | 84 (45.9%)      |                 |
| No              | 99      | 54.1%           |                 |
| Module Usage    |         |                 |                 |
| Yes             | 183     | 149 (81.4%)     |                 |
| No              | 34      | 18.6%           |                 |
| Module Completion |         |                 |                 |
| All Three       | 178     | 149 (83.7%)     |                 |
| Two             |         | 22 (12.4%)      |                 |
| One             |         | 5 (2.8%)        |                 |
| None            |         | 2 (1.1%)        |                 |
| Discussion Participation c |         |                 |                 |
| Fully Completed | 178     | 680 (63.7%)     |                 |
| Partially      |         | 11 (1.0%)       |                 |
| Participated    | Missed  | 377 (35.3%)     |                 |
| Time Spent on Blackboard |         |                 |                 |
| Hour            | 180     | 108.18          |                 |
| Knowledge Acquisition |         |                 |                 |
| Grade Expected to Receive |         |                 |                 |
| A               | 183     | 85 (46.4%)      |                 |
| B               |         | 79 (43.2%)      |                 |
| C               |         | 17 (9.3%)       |                 |
| D               |         | 2 (1.1%)        |                 |

Data Source: eCampus platform (Module Completion, Discussion Participation, Time Spent on Blackboard, and Grade)
Self-reported survey (Gender, Level, Major, Blackboard acknowledgment prior to the course, Module usage as guided, and Grade expected to receive)

a Other non-related majors are categorized into one group.

b A likert-scale question (“I did not use the module before class, although I was supposed to”) was converted.

Yes = Strongly disagree, Disagree, and Neither agree nor disagree, No = Strongly agree and agree

Students were assigned to complete 6 discussion boards (total 1068 responses).
students believed the instructional delivery method did not limit their interaction with the professor. Flipped teaching could not, however, necessarily be shown to be a more engaging style of teaching than the traditional classroom with 47.0% of the total students agreeing that flipped teaching was more engaging and only 20.2% disagreeing.

**Information accessibility**

Information delivered by traditional teaching methods such as in-class PowerPoint delivery was positively reviewed by 61.6% students (see Table 4). Only 2.2% of students thought the in-class PowerPoint lectures were irrelevant to the course while 88.5% confirmed their usefulness. In the same context, 6.5% of students believed the in-class cinematic screenings to be irrelevant while a majority 62.9% of students thought them to be helpful. Simultaneously, information delivered by flipped teaching methods such as online modules and in-class question feedback were considered helpful by 78.7% of the students, over 15% higher than the traditional method review (see Table 4). Assigned readings were considered relatively less helpful by students. Course materials appeared to be viewed easily by most students in a multitude of environments. A majority of the stu-
dents attempted flipped materials at their homes (89.6%) with some taking them in more public areas such as libraries or study halls due to the support of existing technical equipment in these locations (see Table 5).

While the utilized materials were rated helpful overall and accessibility appeared to be a minor issue, technical problems can be a major obstacle to flipped teaching (Strausheim, 2013). Around 14% of students reported internet connection was a primary problem with 7% experiencing glitches when interacting with the modules. These issues resulted in students having to re-take modules which may have been submitted early due primarily to internet connection and/or web browser incompatibilities. The issues were typically based on software compatibility, not user error. Unlike the common concerns of technical accessibility, only 2.2% reported unfamiliarity with the software utilized in the flipped assignments (see Table 5).

### Table 4. Course Materials and Assessment Tools Perceived Effectiveness.

<table>
<thead>
<tr>
<th>Question</th>
<th>Irrelevant to learning</th>
<th>Not helpful</th>
<th>Neutral</th>
<th>Somewhat helpful</th>
<th>Very helpful</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course Materials</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional Teaching</td>
<td>In-class PowerPoint lectures</td>
<td>2 (1.1%)</td>
<td>2 (1.1%)</td>
<td>17 (9.3%)</td>
<td>65 (35.5%)</td>
<td>97 (53.0%)</td>
</tr>
<tr>
<td></td>
<td>In-class Cinematic screenings</td>
<td>1 (0.5%)</td>
<td>11 (6.0%)</td>
<td>56 (30.6%)</td>
<td>68 (37.2%)</td>
<td>47 (25.7%)</td>
</tr>
<tr>
<td></td>
<td>Readings</td>
<td>10 (5.5%)</td>
<td>23 (12.6%)</td>
<td>89 (48.6%)</td>
<td>41 (22.4%)</td>
<td>20 (10.9%)</td>
</tr>
<tr>
<td>Flipped Teaching</td>
<td>In-class questioning and feedback using PowerPoint slides</td>
<td>2 (1.1%)</td>
<td>3 (1.6%)</td>
<td>24 (13.1%)</td>
<td>66 (36.1%)</td>
<td>88 (48.1%)</td>
</tr>
<tr>
<td></td>
<td>Blackboard online modules</td>
<td>2 (1.1%)</td>
<td>5 (2.7%)</td>
<td>30 (16.4%)</td>
<td>71 (38.8%)</td>
<td>75 (41.0%)</td>
</tr>
<tr>
<td></td>
<td>Flipped course discussion</td>
<td>6 (3.3%)</td>
<td>11 (6.0%)</td>
<td>34 (18.6%)</td>
<td>72 (39.3%)</td>
<td>60 (32.8%)</td>
</tr>
<tr>
<td></td>
<td>Help from the instructors after class</td>
<td>2 (1.1%)</td>
<td>1 (0.5%)</td>
<td>76 (41.5%)</td>
<td>46 (25.2%)</td>
<td>58 (31.7%)</td>
</tr>
<tr>
<td></td>
<td>YouTube videos</td>
<td>4 (2.2%)</td>
<td>14 (7.7%)</td>
<td>56 (30.6%)</td>
<td>76 (41.5%)</td>
<td>33 (18.0%)</td>
</tr>
<tr>
<td><strong>Assessment Tools</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional Teaching</td>
<td>Online exams</td>
<td>3 (1.7%)</td>
<td>0 (0.0%)</td>
<td>13 (7.1%)</td>
<td>56 (30.6%)</td>
<td>111 (60.7%)</td>
</tr>
<tr>
<td></td>
<td>Quizzes</td>
<td>6 (3.3%)</td>
<td>5 (2.7%)</td>
<td>28 (15.3%)</td>
<td>79 (43.2%)</td>
<td>65 (35.5%)</td>
</tr>
<tr>
<td>Flipped Teaching</td>
<td>Blackboard test your knowledge modules</td>
<td>2 (1.1%)</td>
<td>1 (0.5%)</td>
<td>22 (12.0%)</td>
<td>82 (44.8%)</td>
<td>76 (41.6%)</td>
</tr>
<tr>
<td></td>
<td>Flipped course questions</td>
<td>5 (2.7%)</td>
<td>5 (2.7%)</td>
<td>23 (12.6%)</td>
<td>82 (44.8%)</td>
<td>68 (37.2%)</td>
</tr>
<tr>
<td></td>
<td>Discussion forums</td>
<td>5 (2.7%)</td>
<td>20 (10.9%)</td>
<td>79 (43.2%)</td>
<td>43 (23.5%)</td>
<td>36 (19.7%)</td>
</tr>
</tbody>
</table>

Cell entries represent the frequency (proportion) of respondents.
Table 5. Individual Experiences of Flipped Course Materials.

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
<th>Freq. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reason why “flipped” assignments were not completed on time</td>
<td>I had internet connection problems</td>
<td>26 (14.2%)</td>
</tr>
<tr>
<td></td>
<td>There were glitches in the interface</td>
<td>12 (6.6%)</td>
</tr>
<tr>
<td></td>
<td>I was unfamiliar with the software used</td>
<td>4 (2.2%)</td>
</tr>
<tr>
<td>Place Flipped Course was taken</td>
<td>At home/your room</td>
<td>164 (89.6%)</td>
</tr>
<tr>
<td></td>
<td>In library</td>
<td>11 (6.0%)</td>
</tr>
<tr>
<td></td>
<td>In a designated study area (i.e. Study Hall)</td>
<td>4 (2.2%)</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>4 (2.2%)</td>
</tr>
<tr>
<td>Average Stopping Time of Flipped Course Material</td>
<td>Never</td>
<td>11 (6.0%)</td>
</tr>
<tr>
<td></td>
<td>Once</td>
<td>34 (18.6%)</td>
</tr>
<tr>
<td></td>
<td>2-4 Times</td>
<td>81 (44.3%)</td>
</tr>
<tr>
<td></td>
<td>5-7 Times</td>
<td>31 (16.9%)</td>
</tr>
<tr>
<td></td>
<td>More than 7 times</td>
<td>26 (14.2%)</td>
</tr>
<tr>
<td>Reason why “flipped” assignments were not completed on time</td>
<td>I completed all assignments on time</td>
<td>84 (45.9%)</td>
</tr>
<tr>
<td></td>
<td>The length of the materials covered was too long to</td>
<td>16 (8.7%)</td>
</tr>
<tr>
<td></td>
<td>hold my attention</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I forgot/was unaware of the deadlines</td>
<td>28 (15.3%)</td>
</tr>
<tr>
<td>Average View Time of Flipped Course Material</td>
<td>Never</td>
<td>2 (1.1%)</td>
</tr>
<tr>
<td></td>
<td>Once</td>
<td>53 (29.6%)</td>
</tr>
<tr>
<td></td>
<td>2-3 times</td>
<td>100 (55.9%)</td>
</tr>
<tr>
<td></td>
<td>More than 3 times</td>
<td>24 (13.4%)</td>
</tr>
<tr>
<td>Satisfaction with the way the course was delivered</td>
<td>Yes</td>
<td>173 (94.5%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>10 (5.5%)</td>
</tr>
</tbody>
</table>

**Information stimulation**

For students who completed the flipped course assignments on time, the self-paced approach slightly increased stimulation. Flipped teaching was primarily helpful for those students seeking courses which allow them to learn at their own pace. A majority of the students (55.2%) agreed motivation to learn in the flipped classroom increased and 84.7% enjoyed the self-pacing capabilities of the flipped material. However, 12.6% did appear to be de-motivated by the approach (see Table 6). Self-motivation of students was increased by the allowance of students to stop the materials when necessary and return to it at a later time. Around 75% of the students in the course stopped the flipped materials more than once with 44.3% pausing the materials between 2-4 times and only 6% continuing without stopping the material (see Table 6).

**Information interaction**

Sixty-nine percent of the students viewed the flipped material two or more times, suggesting that students accessed the information repetitiously and with relative ease. This
Table 6. Survey Results on the Learning Experience of Flipped Teaching.

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Information Communication</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The “flipped” courses did not limit my interaction with the professor.</td>
<td>3 (1.6%)</td>
<td>4 (2.2%)</td>
<td>39 (21.3%)</td>
<td>97 (53.0%)</td>
<td>40 (21.9%)</td>
<td>3.91</td>
</tr>
<tr>
<td>The “flipped classroom” is more engaging than the traditional classroom.</td>
<td>7 (3.8%)</td>
<td>30 (16.4%)</td>
<td>60 (32.8%)</td>
<td>55 (30.1%)</td>
<td>31 (16.9%)</td>
<td>3.40</td>
</tr>
<tr>
<td>The “flipped classroom” allows me greater opportunities to communicate</td>
<td>9 (4.9%)</td>
<td>50 (27.3%)</td>
<td>76 (41.5%)</td>
<td>32 (17.5%)</td>
<td>16 (8.8%)</td>
<td>2.98</td>
</tr>
<tr>
<td>with other students.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Information Accessibility</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like the ability to self-pace my learning with “flipped courses”.</td>
<td>0 (0.0%)</td>
<td>6 (3.3%)</td>
<td>22 (12.0%)</td>
<td>74 (40.4%)</td>
<td>81 (44.3%)</td>
<td>4.26</td>
</tr>
<tr>
<td>I am more motivated to learn in the “flipped classroom”.</td>
<td>4 (2.2%)</td>
<td>19 (10.4%)</td>
<td>59 (32.2%)</td>
<td>57 (31.1%)</td>
<td>44 (24.1%)</td>
<td>3.64</td>
</tr>
<tr>
<td><strong>Information Accumulation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall, “flipped classroom” enhanced my learning in this course.</td>
<td>1 (0.5%)</td>
<td>3 (1.6%)</td>
<td>34 (18.6%)</td>
<td>83 (45.4%)</td>
<td>62 (33.9%)</td>
<td>4.10</td>
</tr>
<tr>
<td>The “flipped classroom” improved my learning about the history of landscape architecture.</td>
<td>1 (0.5%)</td>
<td>8 (4.4%)</td>
<td>32 (17.5%)</td>
<td>93 (50.8%)</td>
<td>49 (26.8%)</td>
<td>3.99</td>
</tr>
<tr>
<td>I wish more instructors used the “flipped or inverted classroom” model.</td>
<td>6 (3.3%)</td>
<td>13 (7.1%)</td>
<td>28 (15.3%)</td>
<td>79 (43.2%)</td>
<td>57 (31.1%)</td>
<td>3.92</td>
</tr>
</tbody>
</table>

Cell entries represent the frequency (proportion) of respondents

suggests that, for the most part, students were able to interact with the information as needed. Simultaneously, 94.5% of the students said they were satisfied with the way the course was delivered (see Table 6) indicating not only that material accessibility was a minor issue, but interaction with the information available was frequent and enjoyable. Positive attitudes toward course materials and quality and interactivity of the materials utilized helped reinforce information interaction.

Statistically, interaction with course information was shown to be positively influential towards perceived knowledge acquisition. A Spearman bivariate correlation and one-way ANOVA were conducted to statistically measure this relationship, examining data on time students’ spent on eCampus and actual grades. The Spearman bivariate correlation between students’ grades (A, B, C, D, or F) and time spent (in hours) on eCampus indicated the degree to which students who utilized eCampus more are were likely to get a higher grade. Results showed that changes in time spent on eCampus were positively correlated with changes in final grades ($r(180) = .319$, $p < .001$) (see Table 7). Specifically, students who received an A or B spent more than 120 hours on average on eCampus whereas students who received a C or D spent only around 80 hours. The one-way
ANOVA was results signified that not all grade groups had the same average time spent on eCampus at a .01 significance level.

**Information accumulation**

Assessment tools of flipped teaching were compared with traditional assessment tools for comparison of impact. Although many students considered online exams more helpful than other tools utilized in the course, the tools associated with flipped teaching were all considered highly beneficial, with a mean rating of 4.25 for module questioning and 4.11 for in-class formative questioning (see Table 4). Discussion forums and question submissions appeared to be less effective with most of the incomplete assignments by students occurring on these portions. Over the entire semester, only 63.7% students completed all question pre-class posting assignments for discussion, with around 35.3% missing one or more class assignments. Only 4.9% of the students believed their learning was not improved through the flipped method (see Table 6). While the number of views of course materials was high, suggesting an elevated motivation by students, the flipped teaching model did show some issues with students meeting deadlines. More than 15% of the students missed certain due dates of assigned flipped materials, with only 45.9% completing all flipped assignments on time during the semester. Nearly 84% of students had grades for all online lecture modules with only 3.9% completing less than 50% of the entire modules.

**Conclusions and Discussion**

This study utilized five measures to assess the perceived effects of flipped teaching on knowledge acquisition in a large lecture format undergraduate university core curriculum course. It was assumed that if a student perceived that they were learning more and were benefiting from the flipped format, they were likely to have higher levels of engagement and have a greater value of the course, leading to better performance and increased rates of persistence. Based on the survey results, information communication was considered the most positively perceived variable in class while information accessibility and information stimulation were the primary positively perceived factors outside of class. Increased accessibility and stimulation can result in increases in interaction with course materials such as lectures, readings, videos, assignments, quizzes, tests, readings, or any other course needs/innovations. An argument against this flipped teaching may be that the approach limits person to person interactivity in the classroom. However, results of this study show an increase student-professor interaction through the flipped model while inter-student interaction showed little to no perceived influence. Overall perceived effects of flipped teaching on each variable are indicated briefly in Table 7.

Results suggest some advantages and disadvantages to using flipped teaching. The approach’s greatest advantage is that it allows students to pace themselves, be self-organizational, access information constantly with the ability to pause and rewind. Computer issues, software incompatibility, or browser connection problems can, however, cause more complications than standard homework in some cases. Such technical glitches may also result in lower scores for students. The combination of visual, auditory, and
interactive learning tools housed in a singular platform tends to increase the retention of information, encouraging in-class discussion and pre-class preparation. While interaction with instructor and classmates can be limited by the approach, the ability to ask questions in class for longer periods can alleviate related issues involved with the disadvantage. For example, if the student has done the assignment and covered the necessary materials for a particular course, that preparation will allow for specific questions to be posed during the designated time. Therefore the approach is highly dependent upon student motivation. There is also a higher potential for distractions when students view the material outside of class. The ability to be able to re-view materials can alleviate this issue somewhat, but can sometimes cause more time to be used for information review than a face-to-face class.

Statistical analyses showed that spending more time on eCampus resulted in significantly higher grade improvement when using the flipped model. Gender, major, and year level proved not to be significant factors. This suggests that the approach can be applied to multiple disciplines, fields, or majors, and is not specific to design based disciplines. The interactive modules and multiple instructional deliver methods used in the course catered to a wealth of learning styles. Thus, a new need presented by this research is for instructors to develop methods to increase student time spent on the eCampus or other platforms for classroom technology support. More interactive methods to for students to digest course materials are necessary and innovative ways to encourage connection between student’s and course material are necessary.

Formative assessment tools and a mixture of differing media for instructional delivery methods proved to be the key to achieving
an effective flipped course. Making the lectures available for studying purposes alongside the interactive modules with built in consistent formative questioning helped to increase knowledge acquisition. Issues such as internet access and web compatibility still plague the inverted method, but overall accessibility to course materials remained relatively high. The technical issues reported by students will continue as long as flipped courses utilize online or computer-based materials. This issue may become less crucial later, but it proves to be a major obstacle to acquiring knowledge and could potentially prevent a stable environment for flipped courses. Increases in internet network coverage and connection speeds will eventually eliminate many of these quandaries. However, this issue is still a limitation that requires further research. Also, flipped teaching appears to be an approach which works better for self-motivated students. The use of a multitude of numerous minor assignments, such as discussion posts or question submission assignments, can sometimes be overlooked by students who are less self-motivated.

In summary, this research creates an initial direct connection between the flipped classroom and perceived increase in student learning. The inverted approach can enhance student learning, but adherence to what the research shows when organizing a course is a salient factor in its enhancement possibilities. Student preference for online assessment over in-class assessment and the overall positive reaction to the flipped style suggests that the pedagogical shift towards the integration of online materials and hybrid courses is a necessary one. This position is reinforced through the finding that videos were preferred over readings, signifying a shift in learning styles from students.

Students of the current era are more engaged with technology than the previous generation and the hope is that education and developing technology can be used as a source to facilitate the teaching-learning process (Halili & Zainuddin, 2015). The flipped learning process makes students take responsibility for their own learning at their own pace. Still, there is much to learn about flipped instruction. First, do students learn more and retain more over the long run when taught with the flipped approach? Because this paper only looked at student learning perceptions at a given point, the question of learning and retaining information over the long run is not fully answered. While the perception of knowledge acquisition shows an increase at a single point in a single course, long-term learning requires much more comprehensive, longitudinal and comparative methods for evaluation. Second, this research did not take into account the impact of flipped learning on student-teacher interaction outside of class. Those not practicing flipped approaches make up for some of this interaction and engagement in courses with higher levels of one on one interaction, during office hours or in meetings with students. While flipped classes afford more student-instructor interaction in class, there is little research shown about student-instructor interaction outside of class. These and other avenues of exploration about the flipped method merit inquiry moving forward to adequately assess the approaches’ true impact.

References


The Perceived Effects of Flipped Teaching on Knowledge Acquisition


The Who, What, and Where of Learning Strategies

Amber D. Dumford¹, Cindy A. Cogswell, and Angie L. Miller

Indiana University, Bloomington, IN 47406

Abstract

Learning strategies have been shown to be an important part of success in the classroom, but little research exists that examines differences across major fields concerning the use and faculty emphasis of learning strategies. This study uses data from the National Survey of Student Engagement and the Faculty Survey of Student Engagement to explore whether there is congruence for academic disciplines between the student use and faculty encouragement of learning strategies. Patterns in the results suggest that certain fields, including health professions, biology, agriculture, natural resources, and social service professions most frequently emphasizing and using learning strategies, while others, including engineering, physical sciences, mathematics, and computer science are less likely to do so. OLS regression models also suggest demographic and environmental predictors of student use of learning strategies, such as gender, enrollment status, cumulative college grades, Greek affiliation, and participation in a learning community. Potential reasons for and implications of these findings are discussed.

Keywords: Learning strategies, disciplinary differences, environmental support, learning communities.

As an important component of the classroom experience in higher education, learning strategies are specific patterns or combinations of academic activities that learners use to gain knowledge (Vermetten, Lodewijks, & Vermunt, 1999; Vermunt, 1996). There are a variety of methods that students can use when studying and learning, and these self-regulating behaviors contribute to student success in a variety of ways. Learning strategies can range from taking notes when reading and in class, to summarizing and organizing new information, to creating an environment that is conducive to studying (Ormrod, 2011). Additionally, learning strategies contribute to regulating and monitoring time, concentration, and enhancing comprehension (McKeachie, Pintrich, & Lin, 1985). Thus, students’ use of learning strategies is closely related to their perception of an emphasis on mastery or performance goal orientation in the classroom (Ames & Archer, 1988).

Learning strategies, through their connection with enhanced metacognitive skills, are additionally relevant to interdisciplinary learning, where students move past declarative and procedural knowledge in a single discipline and apply concepts and themes across multiple areas (Ivanitskaya, Clark, Montgomery, & Primeau, 2002). Metacognition, or “thinking about thinking,” as a learning strategy is demonstrated in the ability to reflect upon,

¹ Corresponding author’s email: adlamber@indiana.edu

The Journal of Effective Teaching, Vol. 16, No.1, 2016, 72-88
©2016 All rights reserved.
understand, and control one’s own learning. Metacognition can directly impact effectiveness of student study, preparation, and classroom time, including how information is learned and retained, and it is related to learning outcomes and success in college. Research suggests that students with greater metacognitive skills have higher grades on classroom exams (Isaacson & Fjuita, 2006), grades in individual courses (Young & Fry, 2008), and cumulative grade point average (Everson & Tobias, 1998; Hall, 2001). Students with these skills are also better at accurately predicting test performance and using formative feedback (Ibabe & Jauregizar, 2010). Furthermore, metacognitive skills are effective across a variety of domains (Everson, Tobias, & Laitusis, 1997), types of tasks (Young & Fry, 2008), and levels of student ability (El-Hindi & Childers, 1996).

While students just beginning their journey in higher education may vary in how effectively they use learning strategies, these should not be considered a fixed ability but rather a fluid skill. As such, increasing the effective use of learning strategies is quite actionable for faculty, staff, and administrators at higher education institutions. Such skills can be increased through a variety of instructional strategies (Schraw, 1998). Research has indicated success in teaching metacognitive skills to students through online self-assessment programs (Ibabe & Jauregizar, 2010), academic support courses for at-risk students (El-Hindi & Childers, 1996), direct tutoring sessions (DeKonty Applegate, Benson Quinn, & Applegate, 1994), and classroom learning contracts (Chiang, 1998).

The curricular environment does not limit the relevancy of learning strategies or their ability to be developed either. At first consideration, one might assume learning strategies to be the most applicable to a traditional classroom format of a professor lecturing while students take notes. However, there is recent research to suggest that learning strategies are effective for other specific pedagogical methods as well. For instance, Downing and colleagues (2009) found that the use of a problem-based learning curriculum increased metacognitive development. Self-regulating learning strategies also increase student success in academic writing tasks (Hammann, 2005), which is an important skill across many disciplines. Supplemental instruction is another curricular approach relevant to learning strategies, as Ning and Downing (2010) found that a peer-assisted instructional intervention increased learning competence and academic performance, even after controlling for pre-intervention learning strategies and academic achievement. Learning strategies are also beneficial for completing assignments that involve online research, as metacognitive awareness allows students to evaluate the credibility and usefulness of sources found during research (Hofer, 2004).

Aspects of the academic and sometimes even residential environment can also affect the learning strategies being used and developed. A prime example of this would be learning communities, which connect the students’ academic studies and the living experience on the college campus (Ebbers & Lenning, 2014; Kuh, Kinzie, Schuh, Whitt, & Associates, 2005; Zhao & Kuh, 2004). Pascarella and Terenzini (2005) define learning communities as “an attempt to move collaborative learning beyond the classroom and into broader aspects of a college student’s life” (p. 109). While the requirements of learning communities differ from campus to campus, it is universal that in some way learning communities expand and continue the student learning experience to reach beyond the classroom. Pas-
carella and Terenzini’s review of the literature on learning communities found that there was “some evidence to suggest that participation in learning communities is linked with student perceptions that they are deriving greater benefit from their academic experiences during college” (2005, p. 109). These benefits go beyond disciplines (Dascalu, et al., 2014; Gannon-Leary & Fontainha, 2013) and extend to the online environment as well (Marin, 2014; Popkin & Lamb, 2014).

In a previous study, Zhao and Kuh (2004) examined the relationship between learning communities and student engagement. They found that participation in learning communities was positively linked to engagement. Furthermore, they also examined the impact of learning communities on grades, finding that first-year students in learning communities had lower grades than those without learning community experiences, but they also had lower SAT/ACT scores. After controlling for SAT/ACT and several other variables, the grades of the first-year students in learning communities were similar to those that were not. However, when examining seniors, there were “no differences in the grades of seniors between those who did and did not have a learning community experience” (Zhao & Kuh, 2004, p. 124), but after controlling for other variables, the grades of those seniors in learning communities were slightly better than those that were not. It is important to determine evidence for the continuation of this learning community trend, even as higher education environments shift toward the development of online spaces and the changing demographics of students. Programs like learning communities require substantial resources from universities, so demonstrating positive outcomes is certainly needed from a logistic perspective.

**Research Questions**

Given the knowledge that learning strategies are effective within multiple curricular approaches, one might assume that learning strategies are appropriate in many different academic disciplines. However, there is a lack of research within higher education that explores the actual use of learning strategies across different major fields. Research by Birenbaum (1997) found that disciplinary differences between education and engineering students are minimal compared to other influences. Nevertheless, there are many other academic majors that are most likely utilizing learning strategies. In what disciplines do students report the most and least frequent use of learning strategies? Furthermore, in what disciplines do faculty report the greatest amount of encouragement of learning strategies in their courses? Is there correspondence between what faculty report encouraging, and what students report actually doing? Does a student living environment that supports learning (such as a learning community) increase students’ use of learning strategies? What are some additional student-level predictors of learning strategy use?

**Theoretical Framework**

The current study seeks to explore these research questions with data from the National Survey of Student Engagement (NSSE) and the Faculty Survey of Student Engagement (FSSE). Taking into account previous empirical research on the use of learning strategies and their connection to successful academic outcomes, it may be beneficial to frame this
research within the work of Pintrich (2004) and his conception of the self-regulatory perspective (SRL) on student motivation and learning. The SRL perspective views students as active participants in learning, who can “monitor, control, and regulate certain aspects of their own cognition, motivation, and behavior as well as some features of their environment” (Pintrich, 2004, p. 387). The SRL perspective has replaced the Information Processing (IP) perspective, which Pintrich (2004) critiqued for being “too limited and not reflective of current theory and research” (p. 386). The SRL perspective expands its perspective of student learning to include affective and social contextual factors. Pintrich (2004) proposed a conceptual framework, based on a SRL perspective. His framework accepts four assumptions of self-regulated learning. They are:

1. “Learners are viewed as active participants in the learning process;
2. Learners can potentially monitor, control, and regulate certain aspects of their own cognition, motivation, and behavior as well as some features of their environment;
3. SRL models of regulation assume that there is some type of goal, criterion, or standard against which comparisons are made in order to assess whether the learning process should continue as is or if some type of change is necessary;
4. Self-regulatory activities are mediators between personal and contextual characteristics and actual achievement or performance” (p. 387-388).

Pintrich’s (2004) framework details self-regulated learning in four phases, and within those phases, four lenses on regulation. The phases reflect planning, monitoring, control, and reaction and reflection. Pintrich acknowledged that “not all academic learning follows these phases as there are many occasions for students to learn academic material in more tacit or implicit or unintentional ways without self-regulating their learning in such an explicit manner as suggested in the model” (p. 389). The phases do suggest an ordered sequence that learners would go through, but the structure of these phases (hierarchically or linearly) are not assumed and can vary in their order. Through the current study, we examine the student and faculty perspectives on self-regulated learning in the higher education setting. Although the terminology may differ somewhat between self-regulated learning, metacognition, and learning strategies, all address a very comparable notion: that there are student cognitions and behaviors associated with a heightened learning experience, and these may be encouraged by faculty and influenced by environmental supports.

**Methods**

**Participants**

The data for this study are from the 2013 administrations of the National Survey of Student Engagement (NSSE) and the Faculty Survey of Student Engagement (FSSE). NSSE is an annual survey administered to first-year and senior students at four-year colleges and universities across the country that documents the extent to which students engage in educationally purposeful activities that have been shown to support and promote student success (McCormick, Kinzie, & Gonyea, 2013). As a companion to NSSE, FSSE was
designed to measure faculty perceptions and expectations of the same educationally purposeful student activities. In addition, FSSE asks faculty about their promotion of learning and development in their courses and the allocation of their time, both course-related and outside of their courses. In 2013, NSSE was administered to students at over 620 four-year colleges and universities, and FSSE was administered to faculty at 146 institutions. The average institutional response rate for NSSE was 30% (27% for first-year students and 33% for seniors) (NSSE 2013 Overview, 2013). For FSSE, the average institutional response rate was 49% (FSSE 2013 Overview, 2013).

For this particular study, only those institutions that participated in both NSSE and FSSE could be included, so that brought the total participants down to just about 16,300 first-year students, 30,000 seniors, and 12,566 faculty at 121 institutions. Of those students who participated, about one-third were male and a majority reported their ethnicity as Caucasian. The subset of students and institutions closely mirrored those in the overall NSSE and FSSE administrations, which in turn closely resemble the national landscape for both students and institutions (FSSE 2013 Overview, 2013; NSSE 2013 Overview, 2013).

**Measures**

The dependent variable, students’ reported frequency of use of learning strategies, was a scale derived from three items that asked how often during the current school year students have: “identified key information from reading assignments”; “reviewed your notes after class”; and “summarized what you learned in class or from course materials.” The four response options for these three items ranged from “Never” to “Very often.” As part of a larger exploratory factor analysis and confirmatory factor analysis for the NSSE survey, a single scale for learning strategies was created from these items (the development of the NSSE engagement indicators is discussed on the NSSE website: http://nsse.iub.edu/html/engagement_indicators.cfm) by first converting the three item to a 60 point scale and then averaging these recoded values. The scale scores ranged from zero (responded “Never” to all four items) to 60 (“Very often” on all four). The alpha reliability coefficient for this scale was 0.77 for first-year students and 0.78 for seniors.

To explore the dimension of discipline, the grouping variable for this study, a categorization that included 11 major groupings was included. These major groupings are listed Table 1 with the frequencies for first-year students, seniors, and faculty members. The largest discipline for first-year students was health professions (16%) and the smallest was communications, media, and public relations (3%). Seniors were mostly likely to report being business majors (18%) and least likely to be majoring in communications, media, and public relations or physical sciences, agriculture, and natural resources (each 3%). For faculty, the most frequently reported discipline was arts and humanities (24%) and the least was engineering (3%). The NSSE and FSSE disciplinary areas were similar to those in the U.S. profile, but there were some slight differences. Seniors in art & humanities major(s) are slight more represented in the sample and engineering major(s) are slight less represented when compared to the U.S. profile (U.S. Department of Education, National Center for Education Statistics, 2015). A greater proportion of faculty respondents...
Table 1. Discipline Frequencies for Students and Faculty.

<table>
<thead>
<tr>
<th>Disciplines</th>
<th>First-Year Students</th>
<th>Seniors</th>
<th>Faculty Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts &amp; Humanities</td>
<td>10%</td>
<td>11%</td>
<td>24%</td>
</tr>
<tr>
<td>Biological Sciences, Agriculture, &amp; Natural Resources</td>
<td>10%</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Physical Sciences, Mathematics, &amp; Computer Science</td>
<td>5%</td>
<td>3%</td>
<td>11%</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>13%</td>
<td>15%</td>
<td>12%</td>
</tr>
<tr>
<td>Business</td>
<td>14%</td>
<td>18%</td>
<td>10%</td>
</tr>
<tr>
<td>Communications, Media, &amp; Public Relations</td>
<td>3%</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>Education</td>
<td>10%</td>
<td>11%</td>
<td>9%</td>
</tr>
<tr>
<td>Engineering</td>
<td>6%</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>Health Professions</td>
<td>16%</td>
<td>14%</td>
<td>10%</td>
</tr>
<tr>
<td>Social Service Professions</td>
<td>5%</td>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>Other disciplines</td>
<td>4%</td>
<td>8%</td>
<td>8%</td>
</tr>
</tbody>
</table>

were in the arts and humanities and a smaller proportion were in the communications, media, and public relations majors (FSSE 2013 Overview, 2013). These differences are mostly likely due to the pool of institutions that choose to participate in NSSE and FSSE, because very few of the participating institutions fall outside of the eight major Carnegie classifications. These majors are the upper level categorizations and the individual majors included in each of these categories can be found in the NSSE codebook (http://nsse.iub.edu/2013_Institutional_Report/data_codebooks/NSSE%202013%20%20Codebook.pdf). In any case, for the analyses the number of respondents in each of the majors was still quite substantial, as the samples for NSSE and FSSE are large. For the 11 major categories, dummy variables were created (with Arts & Humanities as the reference group).

In accordance with the research questions, the two independent variables of interest were participation in a learning community and an aggregated value for faculty emphasis on learning strategies. Participating in a learning community was captured by one NSSE question that asked about participation “in a learning community or some other formal program where groups of students take two or more classes together,” dichotomized to whether or not they had had this experience. The faculty learning strategies scale score was derived by three items on FSSE. Faculty responded on a four-point scale from “Very little,” to “Very much” to “In your selected course section, how much do you encourage students to do the following?” The three items mirrored those on NSSE (“identify key information from reading assignments”; “review notes after class”; and “summarize what has been learned in class or from course materials”), with a scale alpha reliability coefficient of .87. The variable representing faculty’s course emphasis on students using learning strategies was calculated by averaging the faculty learning strategies scale score within each discipline, level (lower-division or upper-division selected course section), and
institution. This average score was then matched with each student by student major, class (first-year or senior), and institution.

We also used several demographic characteristics as controls for statistical modeling purposes. Student characteristics included: gender, race/ethnicity (with White as the reference group), age, enrollment status, first-generation status, transfer status, international status, Greek affiliation, living on campus, athlete status, cumulative college grades, distance education status, and discipline (with Arts & Humanities as reference group). Institutional characteristics included: Carnegie classification (with Baccalaureate Arts & Sciences as the reference group), enrollment size, and control. Previous research (Pascarella & Terenzini, 2005) suggests that there are differences in student engagement and educational experiences for students based on these characteristics. All variables in the model can be seen in Table 2.

Results

First, to explore the existence of disciplinary differences for students’ use and faculty members’ emphasis of learning strategies, means were calculated for each of four groups: first-year students, senior students, faculty whose selected course was lower division, and faculty whose selected course was upper division. Using 4 preliminary chi-squared analyses (one for each faculty and students and at each level), the discipline differences were found to be statistically significant (means can be seen in Figure 1 & 2 and standard deviations ranged from 14 to 17 across the disciplines in all 4 groups). Since congruence was found between first-year students and faculty teaching lower division courses (see Figure 1) and also between seniors and upper division faculty (see Figure 2), aggregate faculty measures were calculated not only based on institution, but also within discipline and course level and then matched with the appropriate first-year or senior students within those same majors. For the second part of the analyses, a pair of ordinary least squares (OLS) regressions (one for first-year students and one for seniors) were used to investigate the relationship between the two measures of interest (the aggregated average of faculty emphasis placed on using learning strategies and student participation in a learning community) and students’ use of learning strategies. In addition, controls for student and institutional characteristics were included.

First-Year Students

For first-year students, the results indicate that 13 of the student characteristics were significant predictors of their use of learning strategies (Table 2). Students who were online-learners, first-generation, female, transfers, older, Black or African American, in the biological sciences, social sciences, or health professions, or had Greek affiliation were more likely to use learning strategies. In contrast, students who were international or lived on campus were less likely. Institutional control (public vs. private) was the only institutional characteristic that was statistically significant. While faculty emphasis on learning strategies was not a statistically significant predictor of first-year students’ use of learning strategies, participating in a learning community was significant (beta = .078, p < .001). Overall, the strongest predictor was cumulative college grades (beta = .111, p < .001).
### Table 2. OLS Regression Results: Effects on Students’ Use of Learning Strategies

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>First-Year</th>
<th>Seniors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student &amp; Institutional Characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online-learner</td>
<td>.068***</td>
<td>.062***</td>
</tr>
<tr>
<td>First-generation status</td>
<td>.026**</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>.069***</td>
<td>.071***</td>
</tr>
<tr>
<td>International</td>
<td>-.024**</td>
<td></td>
</tr>
<tr>
<td>Greek affiliation</td>
<td>.023**</td>
<td>.021***</td>
</tr>
<tr>
<td>Living on Campus</td>
<td>-.06***</td>
<td>-.047***</td>
</tr>
<tr>
<td>Athlete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>.026**</td>
<td>.041***</td>
</tr>
<tr>
<td>Transfer Status</td>
<td>.060***</td>
<td>.122***</td>
</tr>
<tr>
<td>Age</td>
<td>.111***</td>
<td>.082***</td>
</tr>
<tr>
<td>Grades: Mostly A’s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black or African American</td>
<td>.040***</td>
<td>.067***</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td></td>
<td>.023***</td>
</tr>
<tr>
<td>Other race/ethnicity</td>
<td></td>
<td>.020***</td>
</tr>
<tr>
<td>Prefer not to respond</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological sciences</td>
<td>.057***</td>
<td>.032***</td>
</tr>
<tr>
<td>Physical sciences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social sciences</td>
<td>.036**</td>
<td>.022**</td>
</tr>
<tr>
<td>Business</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communications</td>
<td></td>
<td>-.013*</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td></td>
<td>-.026***</td>
</tr>
<tr>
<td>Health professions</td>
<td>.064***</td>
<td>.030***</td>
</tr>
<tr>
<td>Social service professions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other major</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research University (very high)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research University (high)</td>
<td></td>
<td>-.041***</td>
</tr>
<tr>
<td>Doctoral/Research University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masters (large)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masters (medium)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masters (small)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baccalaureate Colleges - Diverse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>.038***</td>
<td></td>
</tr>
<tr>
<td>Institutional size</td>
<td></td>
<td>.037***</td>
</tr>
<tr>
<td><strong>Participation in a learning community</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggregated Faculty Emphasis on LS</td>
<td>.078***</td>
<td>.110***</td>
</tr>
<tr>
<td>Total R²</td>
<td>.065***</td>
<td>.083***</td>
</tr>
</tbody>
</table>

*a* All non-significant coefficients have been removed.

*b* Reference group: White

*c* Reference group: Arts & Humanities

*d* Reference group: Baccalaureate Colleges – Arts & Humanities

*p<.05; **p<.01; ***p<.001
Figure 1: Learning Strategy Indicator Comparisons for First-Year Students and Lower Level Faculty.

Together, the model accounted for 6.5 percent of the total variance in student frequency of use of learning strategies ($R^2 = .065, p < .001$).

**Seniors**

For seniors, the results indicate that 16 of the student characteristics were significant predictors of their use of learning strategies (Table 2). With only a few exceptions, the same patterns that were seen for first-year students were mirrored in senior students as well. Seniors who were online-learners, female, athletes, transfers, older, Black or African American, Hispanic or Latino, another race, in the biological sciences, social sciences, or health professions, or had Greek affiliation were more likely to use learning strategies. In contrast, students who lived on campus or were in communications or engineering were less likely to use them. Both size and the Carnegie classification of Research University (high) were institutional characteristics that were statistically significant. Additionally,
both faculty emphasis on learning strategies (beta = .023, \(p < .001\)) and participating in a learning community (beta = .110, \(p < .001\)) were statistically significant predictors of the frequency of use of learning strategies. In fact, the only predictor stronger than participating in a learning community, making it the strongest in the model for seniors, was age (beta = .122, \(p < .001\)). Together, the model accounted for 8.3 percent of the total variance in student frequency of use of learning strategies (\(R^2 = .083, p < .001\)).

**Discussion and Implications**

When examining the descriptive statistics comparing students to faculty scores on learning strategies, this study found evidence for a general pattern of congruence between the two groups. For both first-year students and lower division faculty, those majoring in or primarily instructing health professions; biology, agriculture, and natural resources; and social service professions tended to cluster near the top of the scores, while conversely those in engineering as well as physical sciences, mathematics, and computer science...
were nearer the bottom of the group. Similar patterns were found when comparing trends between seniors and upper division faculty, and these findings are further corroborated when looking at the results of the regression models as well. Given knowledge of general curricular differences in these disciplines, these results are not necessarily surprising. Engineering and mathematics majors are probably less likely to have traditional reading assignments, and verbal summaries of information may be less important for their success than acquired procedural knowledge. While in this study students from those disciplines did not report use of these learning strategies, in the larger field engineering and mathematics scholars and practitioners are engaged in research on this topic and have introduced other innovative strategies that are research-based into the discipline around classroom learning (e.g. Ro & Loya, 2015; Webb, Stade, & Grover, 2014). On the other hand, the clinical and applied lessons from health and social service professions may lend themselves particularly well to summarizing what information was learned, and key information in the form of medical or biological vocabulary terms may be especially apparent in the reading assignments of biology or health science majors.

When looking at the other variables in the regression models, there were additional findings that were not remarkably unexpected, given the existing literature on student engagement (Pascarella & Terenzini, 2005; Ro & Loya, 2015). For both the first-year students as well as the seniors, females and students with higher cumulative college grades were more likely to be frequently using learning strategies, with higher cumulative college grades having one of the relatively largest coefficients. One would expect that use of learning strategies would go hand in hand with the tangible outcome of better cumulative college grades. Another expected finding was that for seniors, students with full-time status used more learning strategies than their part-time peers, which also makes sense given their additional experiences with coursework. This is in alignment with prior research on the differences between full-time and part-time enrollment status (NSSE, 2012).

Other results from the regression models are consistent with the idea of environmental supports for enhancing learning and success. Both first-year and senior students who are Greek-affiliated were more likely to use learning strategies, which may be due not only to minimum GPA requirements, but also to the presence of structured membership education activities such as study tables and peer tutoring sessions. This adds to existing research on fraternity and sorority membership (Armstrong & Grieve, 2015). This finding is also in alignment with earlier research by Pike and Askew (1990) and DeBard and Sacks (2010) who found that Greek-affiliated students’ grades were not negatively impacted as a result of their Greek-affiliation. DeBard, Lake, and Binder (2006) make specific suggestions concerning ways to promote academic success among new Greek members, noting that required orientation classes to support study strategies and proactive academic behaviors are useful. Moreover, Greek life membership may offer some similar benefits to those of learning communities, as Whipple and Sullivan (1998) suggest that the sense of belonging associated with Greek affiliation, as well as opportunities for leadership, self-governance, and community service are all linked to positive educational experiences.
Furthermore, the physical environment of the classroom, or lack thereof, may play a role as well, since students who were taking all of their classes online were more likely to use learning strategies. This may be a result of the structure of the courses themselves, which rely on more independent self-regulation from the students to read material, watch videos, and complete a variety of other tasks involved with course assignments (Richardson, Morgan, & Woodley, 1999). Online learning environments frequently require students to plan, monitor, react, and reflect (Robinson & Hullinger, 2008). All of these activities require students to integrate and actively practice multiple phases of SRL (Pintrich, 2004; Smart & Umbach, 2007).

Characteristics of this self-directed learning may also interact with other aspects of the students themselves, which could explain why older, non-traditional aged students as well as students that live off-campus are more likely to use learning strategies. Older students may need to be more focused in the allocation of their study time, as they may have jobs, families, and other non-school-related time commitments. This might apply to commuter students living off-campus as well. They must distribute their hours carefully, planning out efficient use of their time on campus and taking into account travel and other activities in their schedule. Certainly age, campus access, and other demographics could be interpreted as some of the personal and contextual characteristics that are mediated through the use of self-regulatory learning activities, as stated in Pintrich’s (2004) theory. This is in alignment with earlier research by Wolters and Benzon (2013), who used a series of multiple regressions analyses on student self-reported data to look for a relationship between motivation and self-regulation. They found that student engagement in motivational regulation was a function of existing motivational beliefs and attitudes.

A final piece of the analysis that provides evidence for the role of environmental elements was that participation in a learning community had a positive impact on the use of learning strategies. Learning communities, which also may include an explicit “study skills” course component, place students in an environment that enhances their scholarly interactions with peers, providing academic modeling of good study habits (Hill & Woodward, 2013; Pike, Hansen, & Lin, 2010; Stefanou & Salisbury-Glennon, 2002). However, it may also be the case that students who are more intrinsically motivated and interested in mastery of course material for the sake of knowledge itself may be more likely to both use learning strategies and participate in learning communities. This interpretation is also fitting with one assumption of Pintrich’s (2004) SRL framework, which notes that learners can control aspects of their own motivation as well as features of their environment. Although these results are promising, more research is needed to determine the direct outcomes of specific learning community participation, as their structures and requirements can vary greatly between institutions.

Another noteworthy finding from the regression models involves the influence of faculty emphasis of learning strategies. Faculty emphasis of learning strategies, aggregated to the discipline level, was a positive predictor of the student use of learning strategies. However, this finding was only significant for the upper division faculty with the senior students. This may be due to the fact that although many first-year students have declared (or least formed an idea of) a major, they are likely to be actually taking courses in a va-
riety of disciplines in order to complete their core curriculum requirements. Therefore, they may not be taking enough major courses for the effect of faculty disciplinary emphasis to be apparent. Once students make it to their senior year, they are usually finished with their general education courses and primarily focused on those in their major. Lower division faculty could respond to this finding by incorporating a discussion of learning strategies into the course syllabi and reviewing learning strategies before and after an examination. Furthermore, centers for teaching and learning could offer seminars on how faculty can better integrate learning strategies into the classroom. Faculty and department chairs could also consider adding undergraduate learning assistants to entry level courses in the discipline or major to assist with better promoting learning strategies to first-year students (Learning Assistant Alliance, 2016).

Several elements of these results can be interpreted through the work of Pintrich (2004) and the self-regulatory learning theory. It may also be useful to view these results from a constructivist perspective. The constructivist perspective is not limited to a particular pedagogy, rather it is a theory about the role of the learner as s/he constructs new understandings and integrates new content into existing knowledge and frameworks for understanding. Foundationally, constructivism is interested in helping to strengthen the learner’s ability to better understand, better learn, and better problem solve in real world scenarios and problems. Students’ uses of learning strategies are an extractable measure where researchers and instructors can look within process measures to see what methods students use to create and consider new knowledge. As Schwartz, Lindgren, & Lewis (2009) criticized, seldom do professionals, researchers, and instructors have metacognitive discussions about the student use of learning strategies, let alone assessments of students’ growth in their capacity to learn.

Limitations

There are several limitations to this study that must be considered when interpreting the results and generalizing the findings. First, although the sample is comprised of a wide range of students attending multiple institutions, it is not representative of all students and faculty at four-year colleges and universities in the United States. Colleges and universities elect to participate in NSSE and FSSE for a variety of reasons, mainly for institutional improvement, which may impact the context of the student experience. Additionally, this study does not account for the variation in learning community experiences, which could differ greatly from one institution to another depending on resource allocation and support. Furthermore, given the research design, this study was unable to test for causal relationships between variables, but can only confirm whether or not they are associated. This study also relied on self-reported behaviors, which may not be completely objective. However, most studies looking at student self-reports in higher education suggest that self-reports and actual abilities are positively related (Anaya, 1999; Hayek, Carini, O’Day, & Kuh, 2002; Laing, Sawyer, & Noble, 1988; Pace, 1985; Pike, 1995). Finally, there were relatively weak effect size (beta) coefficients and low percentage of explained variance from the overall models, which suggests that there are many other factors not included in the analyses influencing student use of learning strategies. Therefore, the results should be interpreted with caution.
Conclusion

Although there are some limitations, this study makes a notable contribution to the higher education research on learning strategies. It provides support for disciplinary differences across both student use and faculty encouragement of learning strategies. Furthermore, it delivers additional endorsement of known trends in student engagement while offering information about the importance of supportive structured environments as well. This study suggests the need for a more thoughtful inclusion of learning strategies in some disciplines. It would seem that if faculty are encouraging learning strategies, students do indeed increase their usage. Thus faculty members in certain fields may need to find ways to foster these beneficial practices in their courses. In order to successfully target these reforms, future research is needed to explore the nuances in learning strategies between different academic majors and curricular practices at various points in the undergraduate student experience.

References


FSSE 2013 Overview (2013). Bloomington, IN: Center for Postsecondary Research, Indiana University, School of Education.


NSSE 2013 Overview (2013). Bloomington, IN: Center for Postsecondary Research, Indiana University, School of Education.


Smart, J. C., & Umbach, P. D. (2007). Faculty and academic environments: Using Holland's


Innovations in Teaching: How Novice Teaching Assistants Include LGBTQ Topics in the Writing Classroom

Kathryn S. Jaekel
Northern Illinois University, DeKalb, IL 60115

Abstract

This article examines how three novice graduate teaching assistants included lesbian, gay, bisexual, transgender, and queer topics in their first-year writing classrooms. Findings suggest that inclusion of these topics can be successfully done through attention to identity in the classroom, including current-day events, and structuring classroom activities that support inclusion. Further implications suggest the importance of including graduate teaching assistants in discussions about cutting-edge pedagogical practices in the classroom.

Keywords: Intergenerational attitudes, undergraduates, education, LGBTQ.

The Case for LGBTQ Inclusion

With an increase in visibility for lesbian, gay, bisexual, transgender, and queer (LGBTQ) students on college campuses, scholars have been clear: there is an increased need to incorporate LGBTQ topics in our higher education classroom. Citing chilly campus climates for sexual minority students (Rankin, Blumenfeld, Weber, & Frazer, 2010), scholars have continued to document that college campuses continue to be unsafe. In fact, LGBTQ students continue to face discrimination, harassment, and even violence on campuses (Rankin, 2003; Rankin, 2005; Rankin et al., 2010; Sanlo, 2004).

Importantly, discrimination often extends into the classroom where, according to Connolly (1999), students often face exclusion in both course curricula as well as in pedagogical strategies. Faculty play a key role in supporting LGBTQ students (Renn, 2002). Faculty need to work to include multiple representations of LGBTQ individuals in their curriculum as well as allow space for students to make meaning of these topics. Moreover, it is important for faculty do their own research, stay up-to-date on LGBTQ topics and issues, and information collected on and off their campus (Allen, 1995; Furrow, 2012; Renn, 2000). This also includes noting language changes. For instance, the term “queer,” once considered a pejorative term, has become, in contemporary use, a celebratory word for identity as well as for a broader area of study in the academy (e.g., queer studies).

1 Corresponding author's email: kjaekel@niu.edu

©2016 All rights reserved.
While these strategies are excellent ones, there continues to be a gap in the literature regarding how to actually include LGBTQ topics in the classroom. While many have indicated that there is a need to include these topics, there are few concrete examples of how to engage in LGBTQ inclusion within curriculum. With the recent Supreme Court ruling for marriage equality in the U.S., coupled with several state laws introducing discriminatory policies (e.g., Indiana, Louisiana), LGBTQ topics are in the nation’s forefront and students are saturated with these topics. Yet, guidance for addressing these topics in the classroom is limited.

In an effort to better understand what new educators need to feel comfortable including LGBTQ topics in the classroom, I collected data from 20 new teaching assistants (TAs). From this project, I expected to get data that would help me, as an academic administrator, better understand what new educators would need in regards to their preparation. Yet, in my data collection process, I realized that some of our TAs were already including these topics successfully. Despite little attention paid in the literature regarding how to incorporate these complex topics and issues into the classroom, these “novice” educators were already successfully including the topics in their curricula. These innovations on the part of novice educators can serve as a model for many of us, both novice and experienced, who are teaching in higher education.

Thus, the primary purpose of this article is to detail how new TAs incorporated LGBTQ topics into their writing classrooms. Specifically, this article aims to add to the body of literature regarding how to incorporate LGBTQ topics by sharing both curriculum and classroom management strategies for inclusion of LGBTQ topics. Importantly, while this study focused on writing classrooms, the strategies discussed are transferable to other spaces where learning occurs. In addition, the secondary aim of this article is to discuss that TAs, while often discussed in the research as being novice educators who need help with their classroom teaching, can be innovative, inventive, and provide models for even seasoned educators. Their contributions to teaching allow new ideas, perspectives, and important information for the larger conversation about teaching and learning in higher education. Their presence in classrooms can be incredibly beneficial.

Promising Practices for Inclusion

Literature examining the inclusion of LGBTQ topics details the importance of engaging in effective classroom management. Because hurtful comments and ideas may arise, faculty must be willing to create and maintain a safe classroom atmosphere. To create and maintain this atmosphere, research recommends that faculty immediately handle instances of homophobia and discrimination when they arise (Furrow, 2012; Iconis, 2010; Lopez & Chism, 1993; Renn, 2000). Furrow (2012) writes that because faculty are modeling behavior and attitudes to students, not only must faculty deal with conflict quickly, they must also work to establish a safe context in their classrooms. Strategies that help in establishing and maintain a positive climate include setting the tone the first day of class (Furrow, 2012) and cultivate a climate that allows dialogue and respect (Iconis, 2010), or engaging in feminist pedagogical strategies (Crumpacker & Vander Haegen, 1993).
Another key recommendation of the literature is faculty knowledge. Accordingly, Iconis (2010) writes that faculty must begin by first reflecting on their own biases. This includes reflecting on conscious and unconscious biases, refraining from making homophobic and other hurtful jokes, and perhaps most importantly, not simply being passive in the classroom around LGBTQ topics (Norris, 1992; Renn, 2002). Part of not being passive is becoming more knowledgeable about LGBTQ topics as well as continuing to stay up-to-date regarding these topics and issues (Allen, 1995; Furrow, 2012; Renn, 2000).

Finally, it is important that faculty allow curricular space for LGBTQ topics and issues. Research suggests allowing students space to write about LGBTQ topics (Furrow, 2012; Iconis, 2010; Renn, 2000). Certainly, writing courses can serve this function, as can other courses that incorporate writing or discussions of identity. As Angelo (1993) holds, information that is made to be personal for students is far likelier to be retained and used.

Literature that examines the why and how to include LGBTQ topics is generalized to fit the idea of “all” faculty. To date, little literature exists that discusses how novice educators, namely TAs, can or should include it. This particular group of instructors is an important one to attend to: increasingly, these contingent faculty often teach our first-year courses (Baldwin & Wawrynzki, 2011; Jaeger, 2008). Graduate TAs are a specialized group who often face different obstacles than other faculty member types. For instance, according to Kendall and Schussler (2012), undergraduates often view TAs “as holding a status between students and academic” (p. 188). This status often affects how TAs are viewed; students often see them as having less credibility and power than tenure track faculty (Golish, 1999). Moreover, TAs are juggling gaining their own academic degree as well as teaching responsibilities, ultimately creating an uncertainty for administrators regarding TA roles and responsibilities (Flora, 2007). Given these obstacles, it is important that literature take into consideration the positionality of TAs.

**Theoretical Framework**

The theoretical underpinning used in this article is critical pedagogy. This approach, which grounds educational philosophy in critical theory, holds that education is not neutral. Rather, educational institutions are inherently political and imbedded in systems of power that can actually serve to reproduce power inequities (Giroux, 2001). Tenets of critical pedagogy include reflecting cultural lived experiences, dialogic methods to critical examinations of society, and a transformation of society to create equity for all (Aliakbari & Faraji, 2011).

Given its attention to power, positionality, and equity, critical pedagogy asks both instructors as well as students to examine systems of power and privilege in society (Kincheloe, McLaren, & Steinberg, 2011). In the classroom, students and the instructor are asked to reflect about their social positionality and critically question the world around them. Ultimately, critical pedagogy helps students use what they learn in order to become social justice agents (Enns & Forrest, 2005; Fisher, 2001; Quillian, 2006). According to hooks (2003), critical pedagogy should allow for self-actualization and challenge conformity to the status quo” (p. 72). In examining power systems, attending to lived experi-
ences, and using dialogic forms of communications, critical pedagogues assert that education can be socially transformative in creating equity for all.

**Methods and Setting**

**Research Context**

The research site for this study is a Midwestern public university. The institution, which at the time enrolled over 40,000 students, boasted a rapidly increased enrollment. The institution was 88% white and most undergraduates identified as Christian. The specific department each of the participants taught for was the university’s English department. This department houses the first-year writing program, a two-course sequence program that teaches introductory and advanced writing courses. The first-year writing program enrolls over 7000 undergraduate students each academic year. In order to accommodate this amount of students, the program teaches over 300 sections of first-year writing courses.

Because so many undergraduate students are enrolled in these courses, and because of the high volume of sections, these courses are predominantly taught by graduate students who have been awarded a teaching assistantship. Those awarded a teaching assistantship were required to take one 3-credit graduate course in pedagogy their first semester. Importantly, TAs took this course while teaching one or two courses their first semester. Most of the TAs had little to no teaching experience before arriving at the institution.

**Participants**

As mentioned previously, three graduate TAs talked about how they include LGBTQ topics in their writing classrooms. The first participant, Henry, was a second-year Masters of Fine Arts student in creative writing. He had been teaching for only three semesters and had no previous teaching experience before his graduate program. The next participant, Jasmine, a second year Master’s of Arts student in Literature had been teaching in higher education for three semesters and had some informal teaching experiences before coming into her graduate program. She shared that she had some experience volunteering at a library during story hours for younger children. Beyond that, however, she had no formal experience. Finally, Emily was a first-year Masters of Fine Arts Student in creative writing. She had no teaching experience before her graduate program and had only been teaching a semester before our interview took place. Interestingly, while each of these TAs were new to teaching, each chose to incorporate LGBTQ topics into their classrooms.

**Data Collection**

After receiving IRB approval from the University site, graduate teaching assistants who taught first-year writing were solicited for this study. Participants were sent an email invitation, asking for participation in a study that examined how novice instructors felt about including LGBTQ topics in the classroom. In total, invitations to participate went out to
eighty first-year writing graduate teaching assistants. Of the eighty that were invited, nineteen responded and agreed to participate in a one-time interview with the researcher.

Interviews with participants lasted between 30 minutes to just over an hour. Interview times varied based on if TAs had ever thought about including LGBTQ topics. Those who had thought about inclusion lasted longer than those who had never considered it. Interviews utilized Patton’s (2002) open-ended, semi-structured protocol. Upon the completion of interviews, each was recorded and transcribed verbatim.

Data Analysis

After interviews were transcribed, Miles, Huberman, and Saldana (2014) First Cycle and Second Cycle method of analysis was used when coding data. Data analysis began by using First Cycle, a process where information was identified and chunked through the use of labels. Data was assigned a label to “assign symbolic meaning to the descriptive or inferential information compiled” and serve to begin to identify chunks of data (p. 71). After First Cycle coding was done, Second Cycle coding was used. In this process, patterns of themes were established in order to identify salient and emergent findings.

While in Second Cycle coding, it became clear that while most of the participants did not include LGBTQ topics into their classroom due to a variety of factors, some of the participants had included those topics. Of the 19 interviewed, 3 TAs discussed how they included LGBTQ topics, how they incorporated the topics into their curriculum, and how they felt they had done so successfully. The other sixteen participants interviewed either did not include these topics in their classroom or did not think LGBTQ topics were appropriate in their classrooms. Thus, the three participants who did include LGBTQ topics in their classroom are outlined in this article.

Findings

In interviewing these TAs, the three who included LGBTQ topics into their classrooms did so in similar manners: each included it by talking about the importance of all forms of identity. In addition, all three sought to include LGBTQ topics through discussions of current-events with their students. Finally, all three discussed how they included these topics in part due to their own personal experiences with the LGBTQ community.

Importance of All Forms of Identity

In each of their interviews, all three TAs stressed the importance of discussing identity in their classrooms. Henry, when talking about sexuality and gender, indicated that, “gender identity…comes up very often.” Henry went on to explain that because gender identity came up so often in his course, he actually changed his curriculum to accommodate students’ reflections and experiences with identity. He shared, “I adjusted my curriculum and asked all students to write, with their first assignment, to write about coming to college. And their identity. Uhm, asking, how did it affect their identity and what did it mean for their identity?” In having students write about their experiences coming to college,
Henry stressed how that asked them to think about their who they were, as college students, as students who were away from home for the first time, and what that meant for them.

Henry designed an assignment that had students write a letter to someone, either expressing their feelings about coming to college or thanking someone for their support as they transitioned to college. Henry shared,

I wanted to make it [the assignment] meaningful, you know, think about who they were and about their identity because that’s so important in college… and I guess to allow them [students] to reach out if they needed to… a couple of my students used that experience to come out to their parents. One student wrote that he finally felt like he could be himself, you know, be out as gay.

I asked Henry if he knew if the students actually sent the letters, and he replied, “actually, yeah. I was surprised. But they sent them. All of the students said their parents were really supportive, too. I thought that was really cool, you know?” By allowing space in his curriculum to actually think about what they needed in regards to identity, Henry’s students had an opportunity to actually explore reflect on themselves and importantly, communicate with others about that identity.

Jasmine, who indicated that sexuality and LGBTQ topics “came up quite a bit, actually,” indicated she included LGBTQ topics through readings about identity. In posing questions to students about key theories about identity, she asked students to examine varying identities through different perspectives. She shared, “So, I ask them to consider, like, are we born this way, is it socialization, is identity learned?” She shared further that students are asked to read essays about gender identity, racial identity, and sexual identity and talk about arguments that construct the nature versus nurture debate. Importantly, according to Jasmine, “they don’t argue about it… I don’t allow that. I just ask them to analyze the arguments, what are the arguments saying? What are the implications of viewpoints?” She indicated that she thought there was danger regarding “arguing” or “debating” over identity. Instead, she had students analyze the arguments in a way that made students think about what was and was not being said, but who stood to gain from those arguments. She further shared, “I think that’s the thing with identity…. you don’t get to argue about it. You just try to better understand what people are trying to express, you know?” Her concern with avoiding argument was clear. When asked why that was so important to her, she said, “It would be terrible, I think, to have your identity argued about right in front of you, you know? Like, just terrible. I don’t want students to tell their gay classmates they are sinful.” Importantly, Jasmine was thoughtful about the larger implications of what students, particularly LGBTQ students, would feel like if the classroom erupted into a debate over if their identity was valid or, as Jasmine indicated, “sinful.”

Like Henry and Jasmine, Emily shared that in her classroom she stressed identity. Emily’s approach was a bit different however, in that she had her students explore different organizations and resources available to them on campus. According to Emily, she wanted to ensure that “students explore what is out there, what’s available.” For Emily, one of
the important things about going to college was finding others that had similar experienc-
es. Emily offered, “You know, there’s lots of organizations on campus and I want to
make sure students find them, so that they can find people like them.” Emily went on to
share that because identity is such an important factor in their lives, she felt it was im-
portant that students find other identities like their own. She indicated that, “you know, I
want them to find others that they have things in common with…you know what I mean?
Others to connect with.” Emily went on to share,

Like for instance, in case students are gay, I have them look at different organiza-
tions on campus…and I include like the LGBT Center so that they know its there.
Since the assignment asks them to do research, the students will know its there
and they can find out more about it. And its not too high risk, either. Like, a stu-
dent can say, ‘I’m doing research for a class. That’s why I’m here.’ So they have
an excuse to go to these places, learn more about them, and then find out if they
want to be a part of that organization.

By Emily asking students to look at various organizations or support services available to
her students on campus, she is allowing students to seek out information and research that
further supports their identity, while being thoughtful about providing an opportuni-
ty that is not “high risk” for her students. What is more, she indicated that even if students do
not take advantage of the resources now, “at least they’ll know they’re there. Maybe the
students don’t know their identity. But, in case they ever wonder, they know where they
can go for more information. It’s important to me that they know there are always re-
sources.” Emily was clear that students’ identities may not be fully realized yet, thus, it
was important that part of her instruction be about preparing them for future instances or
questions.

Current Events in the Classroom

Another element all three of the TAs used was incorporating discussions of current
events into their classrooms. Henry, who began every class session with a brief discus-
sion over current events, shared, “We sometimes have very open discussions that span
LGBT topics, uhm, marriage, civil rights, because you know, it’s in the news. Its silly to
not talk about it because it’s everywhere.” Henry shared that because the larger discus-
sion of LGBTQ topics is constant and the media is saturated with the topic, students are
already discussing it. Henry offered, “you know, they [students] are talking about it al-
ready. So we may as well talk about it in class. We are all thinking about it, so let’s talk
about it.” Henry indicated that it would “almost be weird” if he did not talk about it with
students because discussions about LGBTQ topics “are like, everywhere right now.” He
shared that he could not imagine how he could not talk about it in the classroom.

Both Jasmine and Emily discussed that the course readers they chose for their class in-
cluded current-day events and so they chose to include LGBTQ topics. Jasmine shared,

In our textbook, or at least the one I chose, there are articles about gender identity,
religion, the wage gap. You know, these issues are going on, they are relevant to
the students’ lives, and so the reader does a good job presenting the information. That’s a big way I include it.

Similarly, Emily said that she had students read articles about marriage equality, LGBT parenting, and other current event topics. She said, “You know, by having these up-to-date readings, it makes including it easy. The students are familiar with these topics because they [the topics] are everywhere.” Interestingly, all three TAs talk about how students are already talking about these topics and thus, as Henry shared, “We are all thinking about it, so let’s talk about it.” For all three of these TAs, it was evident that they felt the need to talk about LGBTQ topics not only because identity has a key place in the classroom, but because so much discussion about these topics was going on outside of the classroom, it would not make sense to not incorporate them in the class.

Experiences with LGBTQ Community

One of the questions I asked the TAs was how they were prepared to talk about these topics. I was particularly interested if they had formal training, pedagogy classes, or had a background in LGBTQ or Gender Studies. Interestingly, none of the TAs indicated they had any formal or pedagogical training. According to Henry,

Actually, I took it upon myself. I don’t remember any readings about this in my pedagogy class. Uhm, I guess, I guess I just thought it was important. And since I didn’t know anything, I thought I should. So I started doing some of the research myself.

I asked Henry why he was so passionate about including these topics into his classroom, and he said, “You know, I have friends and…and family who identify in the LGBTQ community. And, you know, I’ve seen what happens when they are excluded. And that’s just not the teacher I want to be. I want everyone included.” Henry’s passion for inclusion came from his experiences of watching loved ones struggle with inclusion and acceptance.

Much like Henry, Jasmine and Emily indicated that while neither had formal training nor any pedagogical courses regarding how to include LGBTQ topics, both had family members who were a part of the LGBTQ community. Jasmine shared,

Well, I guess most of my information, and how I approach it in class comes from being an ally to my cousin. She’s my best friend and…and I think that’s why I include it. I see what my cousin faces. And to an extent, because I’m a [sic] ally, I guess I see what I face too.

Jasmine shared that because of her experiences as an ally and because of her close relationship to her cousin who is lesbian, she feels prepared to talk about these topics in the classroom.
Emily also identified as an ally and shared that her sister identified as lesbian. She shared a story about her sister and her sister’s girlfriend,

Well, my sister is a lesbian…and…its interesting, like her girlfriend, her parents told her that if she’s a lesbian they’re not paying for college and so my sister’s like a secret girlfriend and she feels weird about it. And my family’s totally cool with it and so its sad….that parents use college as leverage against her.

This first-hand knowledge that Emily provided was in part why she felt prepared and comfortable including LGBTQ topics. She said, “You know, it’s important. I mean, this is happening everywhere and I think it needs to be talked about.” Because of her connection and experiences with her sister, Emily felt that these topics needed to be included in her classroom.

**Discussions and Implications**

From these three novice TAs, it is clear the LGBTQ inclusion is not only possible, it can be successful. What is more, these TAs were actualizing what the literature had recommended in regards to inclusion. Thus, all three offered up real examples of not only why LGBTQ students and topics should be included, they served to offer examples of how to include these topics. While these TAs did not indicate they had read any of the promising practices literature around inclusion, critical pedagogy, or any formal training on the why or the how of inclusion, each did it anyway.

**Inclusion Through Identity**

In their attention to identity in the classroom, all three TAs were able to design and adapt curriculum so that their students had opportunities to reflect, write, and research about topics that were meaningful to them. This aligns with the literature that indicates the importance of creating and cultivating curricular space for LGBTQ topics and issues. Henry created space in his curriculum by adapting an assignment that allowed students to write a meaningful letter to someone about their identity, creating space for students to come out. As Henry indicated, this allowed for three of his students to actually write letters home, coming out to their parents. This aligns with what research recommends in regards to creating space to write about these topics (Renn, 2000; Iconis, 2010; Furrow, 2012).

This attention to identity also supports recommendations by Angelo (1993) who expresses the importance of having curriculum make connections with students’ lived experiences. It also supports critical pedagogy’s larger outcome of giving a voice to the often-underrepresented groups. In allowing for this space, Henry, Emily, and Jasmine created opportunities for students to find and cultivate their voices through class related activities. When Emily had students read and analyze the larger arguments about identity, students were asked to analyze, not argue, who benefits from varying lines of logic around sexuality. Moreover, when Emily had students research resources available to students who may identify as LGBTQ, students could find the support they needed.
Bridging the Larger Discourse

Each of the TAs utilized discussions of current-day events as a means for inclusion. As Henry indicated, “We are all thinking about it, so let’s talk about it.” He shared further that it would be almost “silly” to not talk about these topics. Jasmine shared that she required students to use a reader that included up-to-date readings about marriage equality, LGBTQ parenting, and gender identity. Importantly, as the TAs brought in current-day events and included the almost-constant media attention to LGBTQ civil rights, these topics were almost normalized. Emily stated that having a reader that included current-day topics, “makes including it easy,” primarily because students already know about these issues. As Emily shared that these topics “are everywhere.”

Rather than inscribing risk to these subjects, all three included these topics in a manner that presented LGBTQ issues, topics, identities, and rights in a way that allowed students to analyze instead of react. In particular, Jasmine shared the importance of avoiding the debate trope in her classroom. Rather than having students debate LGBTQ identity or its validity, she had students explore, critically examine, and question representations. Again, this is a tenet of critical pedagogy; students critically question hegemonic representations rather than argue what is “right” or “wrong.” As she indicated, “It would be terrible, I think, to have your identity argued about right in front of you [pause] just terrible.” This insightful remark illustrates that Jasmine, and the two other TAs, are aware of issues in classroom management. Much attention is paid to issues of classroom management in the literature, however the TAs never really explicitly talked about classroom management. They never shared that it was a concern for them. Rather, they set up their curricula in such a way that normalized LGBTQ identity, did not allow for debate style conversations, and had students engage in thoughtful exercises about the topics.

Limited Formal Preparation

Perhaps what is so interesting about how these three individuals included LGBTQ topics is that each indicated they had little formal training on how to include the topics. Henry and Jasmine had been teaching for only three semesters and Emily for only one. Each were asked about their preparation regarding teaching, pedagogical practices, and any other event that informed their teaching. All three shared that they had taken (or were currently in) a 3-credit pedagogy class that was required for their assistantship. However, beyond that class, none had any other training or preparation. Despite their limited formal training, each engaged, perhaps unknowingly, in a critical pedagogy. Each stressed the importance of inclusion, a critical examination of larger social practices and policies, and a need for equity inside and outside of the classroom.

While all three had a somewhat limited background in pedagogical training, what all three did have in common was their connection to the LGBTQ community. Henry offered that he “took it upon myself” to learn more about the LGBTQ community, topics, and issues. He stated that he felt like he did not have enough information and so he began doing research on his own time. This behavior is a key recommendation in the LGBTQ literature base around inclusion. Faculty knowledge is key for inclusion and success.
estingly, Henry did just that: he recognized that he did not know enough and so he sought out more information.

All three TAs shared that they had some connection to the LGBTQ community. While Henry broadly mentioned he had friends and family, Jasmine shared that her cousin, who identifies as lesbian, really impacted the way she approached inclusion in her classroom. Citing that, “I see what my cousin faces” as well as her own experiences of what she faces as an ally, Jasmine was informed about how to go about inclusion based on her own lived experiences.

Similarly, Emily shared that because of her sister’s experience of being “a secret girlfriend,” due to intolerance of her sister’s girlfriend’s parents, Emily shared that she saw the importance of including these topics. Emily’s experience of watching her sister’s girlfriend face a lack of acceptance from her parents, and their subsequent threat of cutting off all monetary funding affected Emily. Seeing the direct effects of what happens when parents do not accept LGBTQ college students led Emily to include a project in her classroom that would ensure students found support that they needed. Thus, these first-hand experiences being an ally and seeing what LGBTQ students, friends, and family face cultivated these three TA’s use of critical pedagogy.

Conclusions and Recommendations

Clearly these TAs, and likely many other novice instructors, not only thought about inclusionary efforts, they have actually begun practicing them. While they are new educators, from their experiences comes some promising practices of how other educators in higher education can begin LGBTQ inclusion:

- Center key assignments, readings, or activities about students’ identities and lived experiences. This provides space for students to use their own voices and experiences to help them shape what they are learning.
- Develop meaningful writing assignments so students can engage in reflection and research about LGBTQ topics. This allows students to learn more about varying topics.
- Instead of creating an atmosphere of debate, have students discuss. In constructing certain identities, such as LGBTQ identities as “arguments,” students may feel hurt and attacked.

Moreover, these innovative and successful activities, strategies, and curriculum should be shared with other educators. Given that some of our novice educators are already successfully including these topics, it is important to allow a platform for them to share their successes with their colleagues and even experienced educators. These TAs have first-hand experiences including topics that are often deemed “risky” or “hard” in the classroom. Thus, they should be given an opportunity to share what has worked for them. It is recommended that departments hold professional development meetings, colloquia, or other information sharing meetings so that other faculty can see what inclusion of LGBTQ topics looks like. In addition to sharing this information with other faculty, this
information should be shared with other areas on campus such as teaching centers, academic support services, and writing centers.

Perhaps most importantly, a recommendation that emerges from this study is that TAs, while novice, are innovative, talented, dedicated instructors. While much literature covers how TAs should be prepared, what TAs should be taught, and how TAs should structure their classroom, it is important to not forget that they can teach even the most seasoned educator. TAs can and should be an integral part of learning more about teaching, pedagogical practices, and cutting-edge strategies in our higher education classrooms.

References


